Accounting and Business Research

Accounting and Business Research

Editors:
C. W. Nobes, University of Reading
R. H. Parker, University of Exeter

Board of Editorial Referees
J. Arnold, University of Manchester
P. W. Bell, Rice University
A. M. Bourn, University of Southampton
M. Bromwich, London School of Economics
P. Brown, University of Western Australia
D. A. Burgstahler, University of Washington
D. J. Cooper, University of Alberta
D. A. Egginton, University of Bristol
M. Firth, University of Colorado at Denver
J. Flower, Commission of the European Communities
T. A. Lee, University of Edinburgh
R. Ma, Sydney
G. B. Mitchell, Institute of Chartered Accountants in England and Wales
R. C. Morris, University of Liverpool
D. T. Otley, University of Lancaster
J. M. Renshall, Peat Marwick McLintock
L. Revsine, Northwestern University
J. M. Samuels, University of Birmingham
D. Simunic, University of British Columbia
L. C. L. Skerratt, University of Manchester
D. Solomons, University of Pennsylvania
C. R. Tomkins, University of Bath
D. P. Tweedie, Peat Marwick McLintock and University of Bristol
M. Walker, University of Manchester
G. Whittington, University of Cambridge
G. Whittred, University of New South Wales
B. S. Yamey, London School of Economics
S. A. Zeff, Rice University

Editorial Office:
Department of Economics, University of Reading, P.O. Box 218, Reading RG6 2AA, UK.
Tel: 0734 318228

Book Review Editor:
Prof. R. H. Parker, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK. Tel: 0392 263209

Advertisement and Subscription Office:
40 Bernard Street, London WC1N 1LD, UK. Tel: 01 628 7060

The Institute of Chartered Accountants in England and Wales

Incorporated by Royal Charter, 11 May 1880

President

Philip Couse

Secretary:
John Warne

Institute Offices and Library:
Chartered Accountants' Hall, Moorgate Place, London EC24 6EQ. Tel: 01 628 7060

The views expressed in *Accounting and Business Research* are not necessarily shared by the Council of the Institute of Chartered Accountants in England and Wales. Articles in *Accounting and Business Research* are published without responsibility on the part of publishers or authors for loss occasioned to any person acting or refraining from action as a result of any view expressed therein.

© 1990 The Institute of Chartered Accountants in England and Wales.

ISSN 0001-4788

cuk-H01107-20-P006460

Accounting and Business Research
Volume 20 Number 78 Spring 1990

Contents

Dealing with Fuzziness in Cost-Volume-Profit Analysis	Y. Lilian Chan Yufei Yuan	83
A Model of Information System Choice	Ian Dobbs Kevin Keasey	97
The Meaning of Audit Reports	Graham Holt Peter Moizer	111
Post-Tax Capital Investment Appraisal: Plant and Machinery	Richard Mole	123
The Role of Profitability in Divisional Decision Making and Performance Evaluation	R. C. Skinner	135
The Diagnosis and Resolution of Emerging Issues in Corporate Disclosure Practices	R. S. O. Wallace T. E. Cooke	143
Managing It All By Numbers: A Review of Johnson and Kaplan's 'Relevance Lost'	Mahmood Ezzamel Keith Hoskin Richard Macve	153
Ideal Solutions, PTTT, Abjuration and Logic	F. L. Clarke	167
Book Reviews		171

20

Bound Volumes of Accounting and Business Research

Bound volumes with index of Volume 8 1977–78 onwards are available from the Subscriptions Manager, Accounting and Business Research, 40 Bernard Street, London EC1N 1LD, England.
Subscribers wishing to have their own copies bound should address their enquiries to Messrs. George Woodhead and Co., 1 Gloucester Street, Manchester M1 5GP, England.
Microfilmed copies of back numbers are available from Microfilm Ltd., East Ardsley, Wakefield, West Yorkshire WF3 2AT, England.

Subscription Rates

	UK	Overseas	Overseas Airmail
Individual	£22	£24	£29
Student	£11	£12	£17
Corporate/institutional	£32	£33	£38

All Subscriptions may be paid in US dollars at current rates of exchange.

Editorial

1. The winning paper for the Walter Taplin prize is announced below. The winner is chosen by the editorial board.

2. The joint editors express their gratitude to the members of the editorial board and to other occasional referees. The journal could not run without their great efforts. For example, praise is owing to David Emanuel and Ken Peasnell who have recently retired from the board after long service in order to take up other similar duties elsewhere.

3. After two years in Reading, the editorial office is rotating back to Exeter in mid-June 1990. From then, correspondence should be sent to Professor R. H. Parker at the address given for him on the inside front cover of the journal.

Forthcoming Articles

Colin Drury, The Leasing Decision: A Comparison of Theory and Practice.

Richard K. Fleischman and Lee D. Parker, Managerial Accounting Early in the British Industrial Revolution: The Carron Company, A Case Study.

G. Gniewosz, Share Investment Decision Process and Information Use: An Exploratory Case Study.

Derek E. Purdy, Towards a Comprehensive Accounting for Convertible Debt.

Judith Wale, The Reliability of Profits and Asset Values, 1890–1914: Case Studies from the British Coal Industry.

Walter Taplin Prize

The British Accounting Association and Accounting and Business Research offer a prize of £100 for the best article published in each annual volume. The prize is named in honor of the journal's founding editor, the late Walter Taplin. The prize relating to Volume 19 (1988/89) is awarded to Don Egginton, John Forker and Mark Tippett for their paper on 'Share Option Rewards and Managerial Performance: An Abnormal Performance Index Model' which was published in the Summer 1989 issue.

Reproduction Policy

P. 6460

Permission is hereby granted to reproduce without charge any article in this issue of Accounting and Business Research for use in courses of instruction provided that the source and the author's copyright are indicated in such reproduction.

Objective of Accounting and Business Research

The objective of Accounting and Business Research is the publication of substantial and original contributions to knowledge in the areas of accounting and finance, broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

Accounting and Business Research, Vol. 20, No. 78, pp. 83–95, 1990

Dealing with Fuzziness in Cost-Volume-Profit Analysis

Y. Lilian Chan and Yufei Yuan*

Abstract—A major limitation of the traditional cost-volume-profit (CVP) analysis is its inability to account for uncertainty and risk. This deficiency has been resolved by the development of probabilistic and stochastic CVP models which require precise numerical assessment of uncertainties in sales demand. There remains, however, imprecision in the expert's assessment of the sales demand distribution. Sub-optimal decisions may result because such fuzziness is being ignored in the analysis. In this paper, the application of Fuzzy Set Theory to handle imprecision is presented, and it is suggested that the methodology is appropriate for accounting applications, especially those involving human judgement.

A limitation of the traditional cost-volume-profit (CVP) analysis, as pointed out by Jaedicke and Robichek in their classic 1964 article, is its inability to deal with uncertainty and risk. Since then, probabilistic and stochastic CVP modelling have received considerable attention in the accounting literature (see, e.g., Lau and Lau, 1987; Constantinides, Ijiri and Leitch, 1981; Ismail and Louderback, 1979; Shih, 1979; Adar, Barnea and Lev, 1977; Lau and Lau, 1976; Liao, 1975). In general, these models assume that sales demand is subject to uncertainty, thereby implying the importance of knowing the sales demand distribution for their application in everyday business.

Certain techniques that can be used in estimating the sales demand distribution are described in Kaplan (1982, pp. 185–192). Because of the irrelevance of historical data, the general approach used to estimate the sales demand distribution is the elicitation of probabilities from the expert—the sales manager. As decision makers prefer to describe their uncertainties by using the English language rather than reducing everything to numbers (Watson, Weiss and Donnelly, 1979), responses from the expert may include:

> 'there is *a good chance* of selling 20,000 units'; 'it is *very unlikely* that sales will fall below 5,000 units'; and 'it is *most probable* that sales will be in the range of 14,000 to 16,000 units'.

These responses, however, are inadequate for generating the sales demand distribution. Consequently, the expert is forced to give numerical assessments of probabilities, and his responses then become:

> 'the chance of selling 20,000 units is 35%'; 'the likelihood of sales falling below 5,000 units is 10%'; and 'the probability that sales will be in the range of 14,000 to 16,000 units is 50%'.

In this case, 'precise' assessment of probabilities (e.g., 35%, 10% and 50%) replaces the expert's linguistic expression of uncertainties (e.g., a good chance, very unlikely and most probable). Since the expert's 'impreciseness' in describing uncertainties using the English language is being ignored in the elicitation process, the resultant sales demand distribution can be erroneous and, consequently, the decision outcome can be misleading.

In fact, as long as an expert's subjective assessment on certain variables is required in decision analysis, 'impreciseness' or 'fuzziness' is involved. If such fuzziness has not been incorporated into the decision model, the real situations are not being represented correctly and the decision thus made can be erroneous. Therefore, the purpose of this paper is to demonstrate how Fuzzy Set Theory can be applied to decision analysis, CVP analysis in particular, and to examine its impact on decision making.

The decision problem

Cost-volume-profit analysis is frequently used by management as a basis for choosing among alternatives. The managers have to determine (1) what is the sales volume required to achieve a target level of profits, and (2) what is the most profitable combination of products to produce and sell?

---

*The authors are assistant professors, respectively, of accounting and of information systems, at the Faculty of Business, McMaster University, Canada.

The decision problem presented here deals with the choice of a new product. It is assumed that the company is considering the introduction of two new products, X and Y. Either product can be manufactured with the present facilities for an incremental fixed cost (FC) of $2,200,000. Other data regarding the products are:

	Product X	*Product Y*
Selling price, p	$40.00	$21.00
Variable costs, v	26.80	9.00

The sales demand of these two products, however, is uncertain. In order to determine which product to manufacture, knowledge about the products' sales demand distributions is essential. Accordingly, advice from the sales expert is searched for. If it can be assumed that sales demand follows a normal distribution,[1] the expert will be required to estimate the expected level as well as the standard deviation of sales, which are given as follows:

	Product X	*Product Y*
Expected sales, E(s)	180,000 units	200,000 units
Standard deviation of sales, SD(s)	25,000 units	35,000 units

The generally accepted criteria for determining which product to manufacture are (1) the maximisation of expected profit and (2) the maximisation of the probability of achieving a target profit. Accordingly, as illustrated below, product Y should be the company's choice as its expected profit as well as the probability of achieving a target profit of say $210,000 is greater than that of product X.

	Product X	*Product Y*
1. Expected profit,[2] $E(Z)$	$176,000	$200,000
2. Probability of achieving a target profit Z° of $210,000,[3] Prob $(Z \geq Z^\circ)$	0.0869	0.3859

However, as indicated earlier, fuzziness is involved in the expert's subjective assessment of the parameters of the normal sales distribution (E(s) and SD(s)), and the decision thus made can be sub-optimal. Therefore, it is necessary to develop procedures for (i) describing the fuzziness of the input variables (E(s) and SD(s)); (ii) deriving the fuzziness of the output (or decision) variables ($E(Z)$ and Prob $(Z \geq Z^\circ)$); and (iii) comparing the fuzzy decision variables between products X and Y so that a better decision can be made. Such procedures are presented in the next section where Fuzzy Set Theory is described.

Fuzzy set theory

Zadeh (1965) argued that conventional quantitative techniques are inadequate in studying humanistic systems because they are not equipped to handle the impreciseness of many such systems and they implicitly assume that precise numerical inputs for the decision analysis are obtainable (e.g., the 'precise' estimates of E(s) and SD(s) in probabilistic CVP analysis). Zadeh also argued that attempting to use the concepts and techniques of probability theory to deal quantitatively with such impreciseness is questionable because probabilities deal with randomness; a concept that should be distinguished from fuzziness. According to Bellman and Zadeh (1970), randomness refers to the occurrence or non-occurrence of an event whereas fuzziness refers to the degree of belongingness of an object (or event) to a class. For instance, the statement that 'the probability of selling more than 180,000 units is *about* 50%' involves both randomness and fuzziness. There is fuzziness regarding the probability estimate of the occurrence of the random event of selling more than 180,000 units. In fact, the phrase 'about 50%' implies that the probability can be 49%, 50%, 52% or even 55%. Such fuzziness can be accounted for quantitatively in decision models using the Fuzzy Set Theory. The theory can be employed in situations where 'precise' numerical assessments of input variables are not possible. It can also be applied in conjunction with probability theory to represent fuzziness as well as randomness in various decision settings. One should note that Fuzzy Set Theory is not competing with probability theory in decision analysis. Rather, the two theories deal with two different concepts: imprecision and uncertainty.

Fuzzy Sets and Membership Functions

As defined by Zadeh (1965, p. 339), fuzzy sets are classes of objects with no crisp boundaries, and the degree to which an object x belongs to the set A is represented by the membership function $\mu_A(x)$. The membership function takes on values between 0 and 1, and it allows for gradual membership such that low values represent a low degree of membership and high values represent a high degree of membership.

---

[1] The sales demand is assumed to follow a normal distribution for conventional purposes. Thus, the expert is required to provide his subjective assessment on the parameters of the normal sales distribution, expected value and standard deviation. It is also possible that the expert may be required to elicit probabilities for other sales distributions. In any case, Fuzzy Set Theory can be applied to deal with the fuzziness in the subjective assessment of either the parameters of the normal sales distribution or the sales probabilities.

[2] $E(Z) = (p - v)E(s) - FC.$

[3] $\text{Prob}(Z \geq Z^\circ) = \text{Prob}(s \geq s^\circ)$
$= \text{Prob}(z \geq [s^\circ - E(s)]/\text{SD}(s))$
where s° = sales required for achieving the target profit Z°; and
z = standard normal variable.

In order to simplify the mathematics of Fuzzy Set Theory (Dubois and Prade, 1978), the membership function of a fuzzy number is often assumed to be piecewise linear and to be represented by four parameters: L_0, L_1, U_1 and U_0 as shown in Exhibit 1; where L_0 is the lower bound with zero degree of membership, L_1 is the lower bound with one degree of membership, U_1 is the upper bound with one degree of membership and U_0 is the upper bound with zero degree of membership. Accordingly, the membership function can be used to describe fuzziness such that L_1 and U_1 describe the most believed range of the fuzzy variable whereas its lower and upper limits of belongingness are represented by L_0 and U_0, respectively.

The membership function can be derived either subjectively or empirically and its preciseness is not very critical as 'the grades of membership are subjective, in the sense that their specification is a matter of definition rather than objective experimentation or analysis' (Zadeh, 1972, p. 5); and 'it is not in keeping with the spirit of the fuzzy-set approach to be too concerned about the precision of [the grade of membership]' (Watson, Weiss and Donnelly, 1979, pp. 2–3).

Therefore, with respect to the decision problem described in the first section, the fuzziness of the parameters of the sales demand distribution (E(s) and SD(s)) can be represented by their membership functions. These membership functions can be generated subjectively with the expert's assistance, i.e., for each product, the sales expert has to identify what he believes to be the range as well as the lower and upper limits for E(s) and SD(s).

Membership Function of Output Variable

Our decision problem is to select the product with the highest expected profit and the greatest probability for achieving a target profit. When we introduce fuzziness of the input variables (E(s) and SD(s)), we need to assess the fuzziness of the output variables (E(Z) and Prob($Z \geq Z°$)). The next step in the analysis is to determine the fuzziness or the membership function of the output variable. According to Watson, Weiss and Donnelly (1979, p. 3), if an output variable is a function of n input variables (i.e., $y = f(x) = f(x_1, x_2, \ldots, x_n)$), then the membership function of the output variable $f(x)$ is given by:

$$\mu_{f(x)}(y) = \max_{\{x:y=f(x)\}} [\min(\mu_1(x_1), \mu_2(x_2), \ldots \ldots, \mu_i(x_i), \ldots \mu_n(x_n))] \qquad \text{(A)}$$

where

$x = (x_1, x_2, \ldots, x_n)$;

$\mu_i(x_i)$ = the degree to which x_i belongs to the possible value of the ith input variable; and

$\mu_{f(x)}(y)$ = the degree to which y belongs to the possible value of the output variable, $f(x)$.

In fact, the derivation of the membership function of the output variable involves an extension of the AND and OR operations of set theory. An example is included in Table 1 to demonstrate the procedures.

In this example, it is assumed that output variable y is the sum of two input variables, x_1 and x_2. That is, $y = f(x) = x_1 + x_2$. It is also assumed that there are three values for each input variable and that their membership functions are discrete, as described by Tables 1(a) and 1(b). In order to determine the membership function of y, the following procedures are applied:

(1) For any given value of y, identify the various combinations of x_1 and x_2 such that $y = x_1 + x_2$. For instance, as shown in Table 1(c), there are three possible combinations of x_1 and x_2 for $y = 8$.

Exhibit 1 Membership Function of Fuzzy Variable

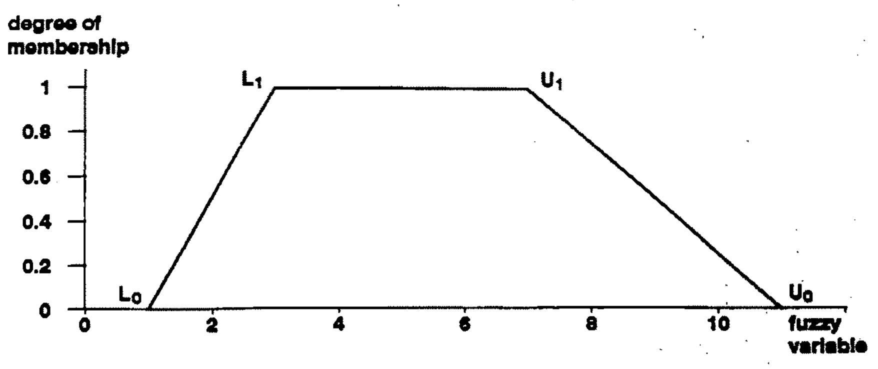


Table 1
Derivation of the Membership Function of the Output Variable from the Membership Functions of the Input Variables

Let $y = f(x) = x_1 + x_2$

(a) Membership Function of Input Variable x_1:

x_1	1	2	3
$\mu_1(x_1)$	0.3	1	0.6

(b) Membership Function of Input Variable x_2:

x_2	5	6	7
$\mu_2(x_2)$	0.7	1	0.2

(c) Membership Function of Output Variable y:

y	6	7		8			9		10
x_1	1	1	2	1	2	3	2	3	3
x_2	5	6	5	7	6	5	7	6	7
$\min(\mu_1(x_1), \mu_2(x_2))$	0.3	0.3	0.7	0.2	1	0.6	0.2	0.6	0.2
$\mu_{f(x)}(y)$	0.3	0.7		1			0.6		0.2

(2) For each combination of x_1 and x_2 identified, determine the minimum of their degrees of membership (i.e., $\min(\mu_1(x_1), \mu_2(x_2))$). In this case, for $y = 8$, there are three possible combinations of x_1 and x_2, and accordingly, three minimum degrees of membership are determined and they are 0.2, 1 and 0.6.

(3) The degree of membership for any given value of y is then defined as the maximum of the minimums determined in (2), (i.e., $\max[\min(\mu_1(x_1), \mu_2(x_2))]$). Therefore, in this example, for $y = 8$, the degree of membership is 1.

By repeating the above procedures for each specific value of y, the membership function of the output variable can then be determined. In this example, simplified assumptions regarding the input variables (three values each), their membership functions (discrete) and $f(x)$ (addition) are used for illustrative purposes. The procedures, nevertheless, can be applied to more complex situations.

Obviously, the computational complexity of the membership function of the output variable depends on the function $f(x)$ itself, as well as the membership functions of the input variables. If the membership functions of the input variables are piecewise continuous and convex,[4] an approach developed by Baas and Kwakernaak (1977) can be used to derive the membership function of the output variable more efficiently.

In essence, the Baas and Kwakernaak approach involves reverse operations. That is, instead of determining the degree of membership for all possible values of the output variables as defined in (A), the lower and upper bounds of the output variable are computed for each degree of membership.

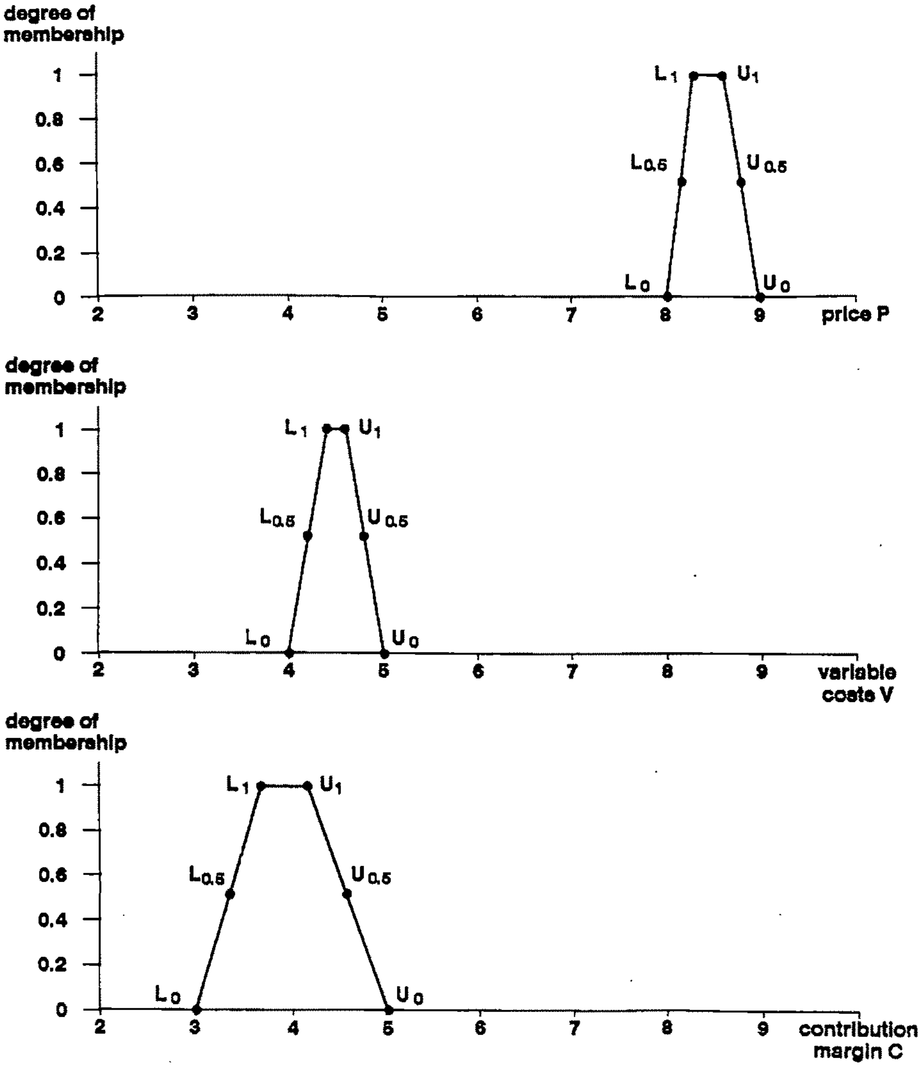
For example (Exhibit 2), let selling price P and unit variable costs V be the fuzzy input variables. The output variable that needs to be computed is contribution margin C, which is given by $P - V$. Then, the Baas and Kwakernaak procedure can be applied in the following manner:

1. For each degree of membership (η), determine the lower and upper bounds for the fuzzy input variables P and $V (L_\eta(P)$ and $U_\eta(P)$; $L_\eta(V)$ and $U_\eta(V))$. For example, as given in Exhibit 2, $L_1(P) = 8.3$, $U_1(P) = 8.6$, $L_1(V) = 4.4$ and $U_1(V) = 4.6$.

---

[4] A fuzzy set A is convex iff $\mu_A(\beta x_1 + (1 - \beta)x_2) \geq \min(\mu_A(x_1), \mu_A(x_2))$ for any points x_1, x_2 of A; and any β: $0 \leq \beta \leq 1$.

Exhibit 2 Derivation of Membership Function of Contribution Margin C from Membership Functions of Selling Price P and Unit Variable Cost V



where $L_0(C) = L_0(P) - U_0(V) = 8.0 - 5.0 = 3.0$;
$L_{0.5}(C) = L_{0.5}(P) - U_{0.5}(V) = 8.15 - 4.8 = 3.35$;
$L_1(C) = L_1(P) - U_1(V) = 8.3 - 4.6 = 3.7$;
$U_1(C) = U_1(P) - L_1(V) = 8.6 - 4.4 = 4.2$;
$U_{0.5}(C) = U_{0.5}(P) - L_{0.5}(V) = 8.8 - 4.2 = 4.6$; and
$U_0(C) = U_0(P) - L_0(V) = 9.0 - 4.0 = 5.0$.

2. The lower and upper bounds of the fuzzy output variable C with η degree of membership can then be determined as follows:

$$L_\eta(C) = L_\eta(P) - U_\eta(V);$$

and

$$U_\eta(C) = U_\eta(P) - L_\eta(V).^5$$

In our example, the lower and upper bounds of C with 1 degree of membership are then given by:

$$L_1(C) = L_1(P) - U_1(V) = 8.3 - 4.6 = 3.7;$$

and

$$U_1(C) = U_1(P) - L_1(V) = 8.6 - 4.4 = 4.2.$$

Thus, the membership function of the output variable can be constructed by simply focusing on the four parameters L_0, L_1, U_1, and U_0 of the input variables,[6] which can be done easily on a spreadsheet (see Table 2 for a template that can be set up on the spreadsheet).

Evaluation of Fuzzy Alternatives

To apply Fuzzy Set Theory to our decision problem, the alternatives have to be compared in fuzzy terms.[7] An example is given below as an illustration of a methodology developed by Nakamura (1986) for evaluating fuzzy alternatives, which is appropriate in this situation.

Assume the decision maker is considering the introduction of two new products, X and Y. With an extensive consumer survey as well as a detailed analysis of price and cost data, the membership functions of the products' profits are developed and are represented graphically in Exhibit 3. The regions R1, R2, R3 and R4 can then be used in determining which product should be introduced.

If the decision maker is risk-seeking, he will concentrate on the high side of the profit continuum and prefer products with high profits. This strategy, in fact, is the maximax approach (i.e. maximising the maximum profits) employed in decision making under uncertainty. The area in region R1 (called Hamming distance, see Kaufmann, 1975) represents the extra profit from product Y as compared with product X. Conversely, the Hamming distance in region R2 is the extra profit made by product X as compared with product Y. Clearly, the ratio of the Hamming distance in region R1 to the sum of the Hamming distances in regions R1 and R2 represents the relative advantage of product Y versus product X with the most optimistic estimation.

On the other hand, if the decision maker is risk-averse, his focus is on the low side of the profit continuum and he still prefers products with the highest of the lowest estimated profits. This is the maximin strategy (maximising the minimum profits). Thus, region R3 represents cases where product Y is preferred whereas region R4 represents situations where product X is preferred. Similarly, the ratio of the Hamming distance in region R3 to the sum of the Hamming distances in regions R3 and R4 represents the relative advantage of product Y versus product X with the most pessimistic estimation.

In dealing with uncertain decision problems, the risk attitude of the decision maker is vital in determining which alternative should be selected. Consequently, a measure of the decision maker's risk attitude[8] α is incorporated in computing γ_{YX}, the degree of preference (fuzzy preference) of product Y as compared with product X:

$$\gamma_{YX} = \frac{\alpha A_1 + (1-\alpha)A_3}{\alpha(A_1 + A_2) + (1-\alpha)(A_3 + A_4)};$$

where

A_i = area of region Ri for i equals 1, 2, 3 and 4; and

γ_{YX} = degree of preference of product Y as compared to product X.

Clearly, γ_{YX} is a score of preference of Y to X weighted by the risk attitude of the decision maker. Therefore, if the decision maker is extremely risk-averse (i.e., $\alpha = 0$), then γ_{YX} is reduced to $A_3/(A_3 + A_4)$. Conversely, for a risk-seeking decision maker, $\alpha = 1$ and $\gamma_{YX} = A_1/(A_1 + A_2)$. A

---

[5] If A and B are any two fuzzy input variables, then the following rules hold for applying the Baas and Kwakernaak approach:

1. $L_\eta(A+B) = L_\eta(A) + L_\eta(B)$; $U_\eta(A+B) = U_\eta(A) + U_\eta(B)$.
2. $L_\eta(A-B) = L_\eta(A) - U_\eta(B)$; $U_\eta(A-B) = U_\eta(A) - L_\eta(B)$.
3. $L_\eta(A \times B) = \min(L_\eta(A) \times L_\eta(B), L_\eta(A) \times U_\eta(B), U_\eta(A) \times L_\eta(B), U_\eta(A) \times U_\eta(B))$;
   $U_\eta(A \times B) = \max(L_\eta(A) \times L_\eta(B), L_\eta(A) \times U_\eta(B), U_\eta(A) \times L_\eta(B), U_\eta(A) \times U_\eta(B))$.
4. $L_\eta(A \div B) = \min(L_\eta(A) \div L_\eta(B), L_\eta(A) \div U_\eta(B), U_\eta(A) \div L_\eta(B), U_\eta(A) \div U_\eta(B))$;
   $U_\eta(A \div B) = \max(L_\eta(A) \div L_\eta(B), L_\eta(A) \div U_\eta(B), U_\eta(A) \div L_\eta(B), U_\eta(A) \div U_\eta(B))$;

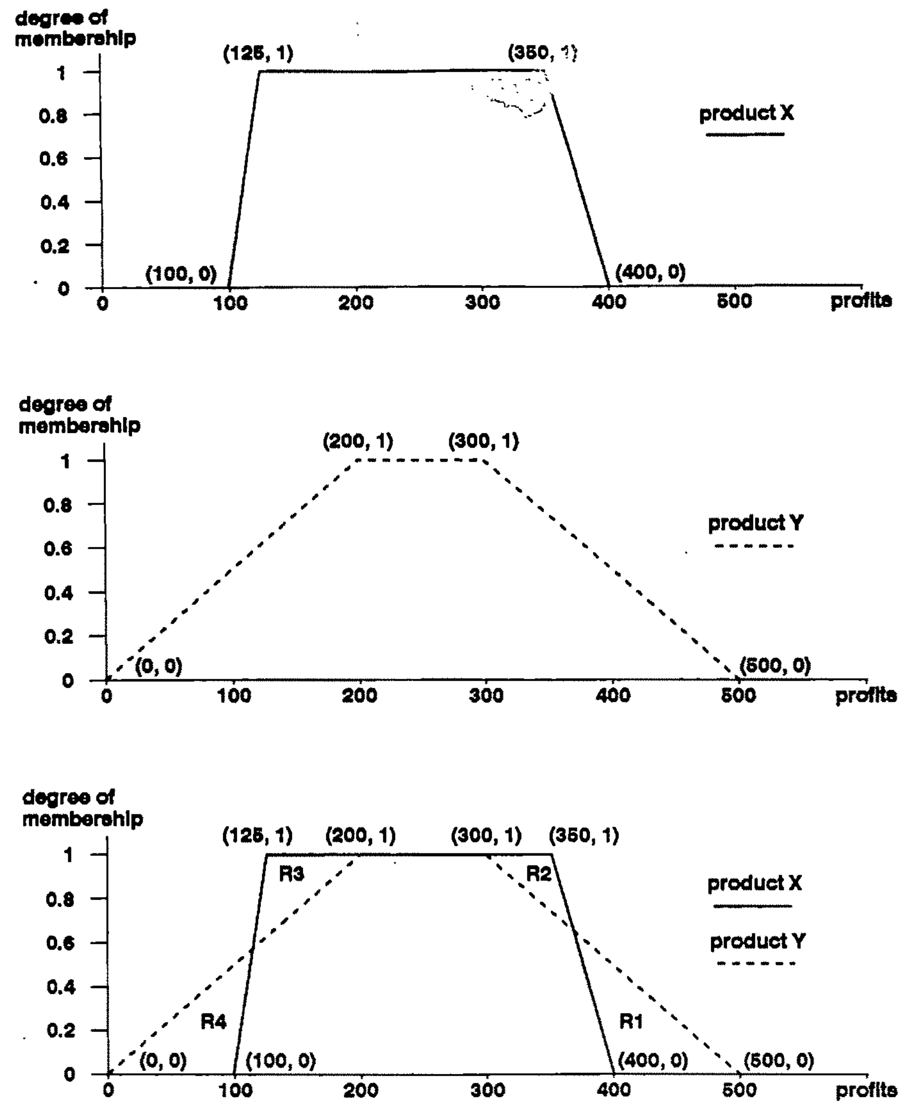
where $L_0(B) \times U_0(B) > 0$.

[6] If the operations involve multiplication and division, the membership function of the output variable over the ranges of L_0 and L_1, as well as U_1 and U_0, may be nonlinear. A linear approximation over these ranges, however, is acceptable as too much emphasis on the 'preciseness' of the membership function is not in keeping with the spirit of the fuzzy set approach (Watson, Weiss and Donnelly, 1979, pp. 2–3).

[7] The comparison of fuzzy alternatives (or fuzzy numbers) is still an on-going research topic; a survey of the literature can be found in Bortolan and Degani (1985).

[8] The α-level employed in Nakamura's model is Hurwicz's pessimism-optimism index criterion for decision making under uncertainty (Luce and Raiffa, 1957, pp. 282–284). It is defined as the payoff of a certain game G1 such that the decision maker is indifferent between the certain game G1 and an uncertain game G2 with payoffs of 0 and 1 of equal uncertainty. Also, low values of α represent risk averseness whereas risk-seeking attitude is described by large α.

Exhibit 3 Membership Functions of Profits



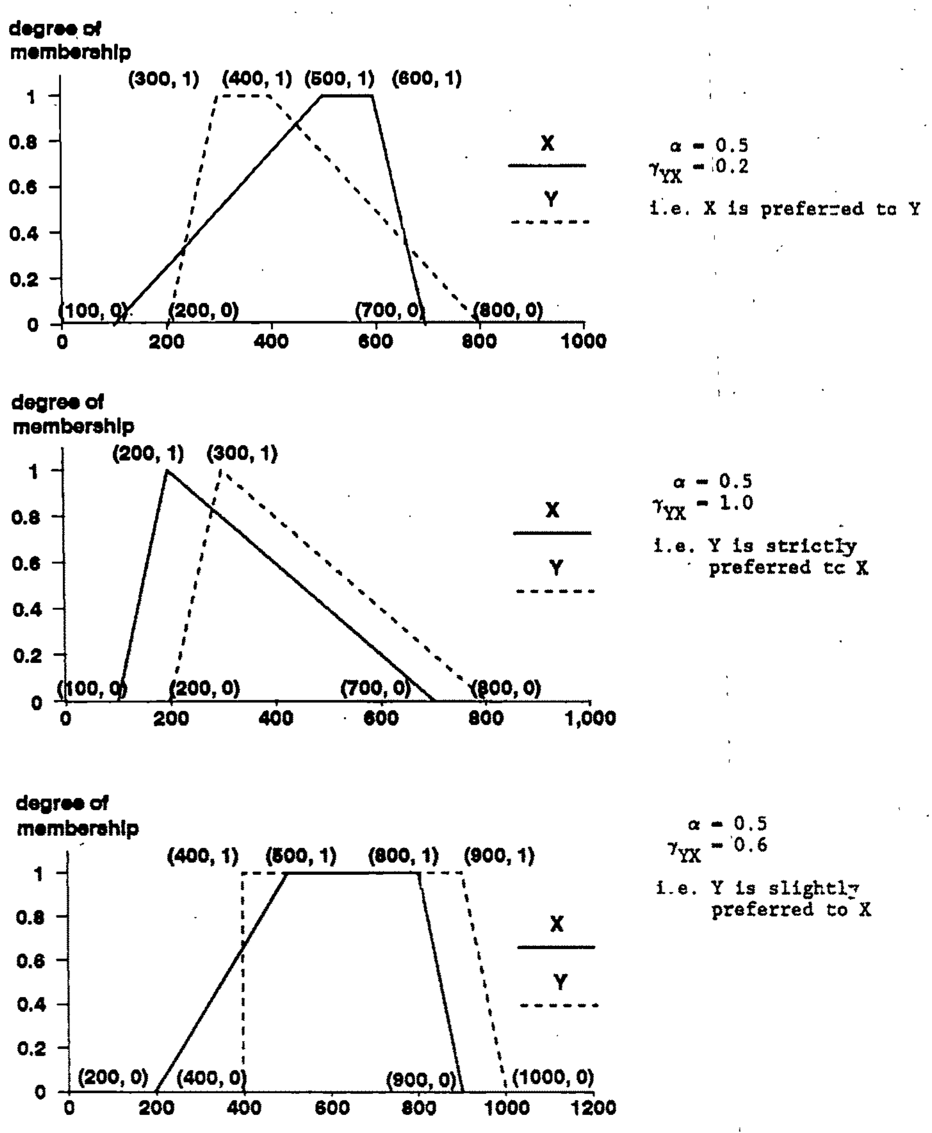
risk-neutral decision maker may select for instance, $\alpha = 0.5$. Thus, with consideration of the decision maker's risk attitude, after determination of α, the following rules apply:

1. if $\gamma_{YX} = 1.0$, product *Y* is strictly preferred to product *X*;
2. if $0.5 < \gamma_{YX} < 1.0$, product *Y* is somewhat preferred to product *X*;
3. if $\gamma_{YX} = 0.5$, product *Y* is seen as indifferent to product *X*.
4. if $\gamma_{YX} < 0.5$, product *X* is somewhat preferred to product *Y*.

For this example, the areas computed are: $A_1 = 33.33$; $A_2 = 8.33$; $A_3 = 16.07$; and $A_4 = 28.57$. Clearly, if the decision maker is extremely risk averse, product *X* is preferred ($\alpha = 0$ and $\gamma_{YX} = 0.36$). Risk-seeking individuals, on the other hand, are interested in product *Y* ($\alpha = 1$ and $\gamma_{YX} = 0.80$). Finally, for risk-neutral individuals, product *Y* is slightly preferred to product *X* ($\alpha = 0.5$ and $\gamma_{YX} = 0.57$). Thus, the fuzzy preference relation developed by Nakamura is very flexible in terms of accounting for the risk attitude of the decision maker. More importantly, the preference of one alternative over another is not absolute; rather a degree of preference is established.

Since preference transitivity holds (Nakamura, 1986), this methodology can also be employed in situations where the decision maker has three or

Exhibit 4 Degree of Preference of Alternative Y as Compared to Alternative X



more alternatives to evaluate. The methodology can also handle various forms of convex membership functions, and a few cases are presented in Exhibit 4 as illustration.

Illustrative examples

Two examples are given in this section. The first considers the fuzziness in the parameters of the normal sales distribution as described in the decision problem. The second example takes into account the fuzziness of all input variables: sales demand, price and costs; this shows that Fuzzy Set Theory can be applied to models with many fuzzy input variables.

Fuzziness in Sales Demand

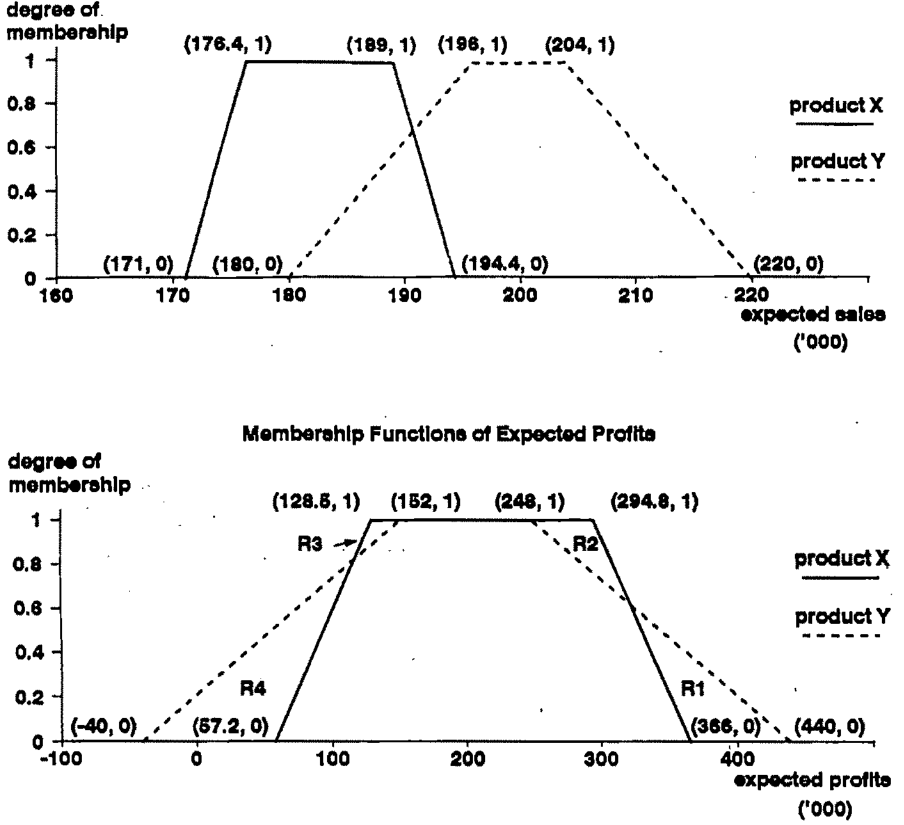
As discussed in the first section, the objective of the decision analysis is to determine which product to introduce with the goal of either maximising the company's expected profit or maximising the probability of achieving a target profit. The company has perfect information about the costs of operations (incremental fixed and variable costs) as well as the selling price of the products. There is, however, imperfect information regarding the sales demand of the two products. Consequently, consultation with a sales expert is warranted.

Based on his expertise, the sales expert suggests that the expected sales of product X is *about* 180,000 units whereas for product Y, it is *around* 200,000 units. The linguistic expression of *about* and *around* indicates that fuzziness is involved. Such fuzziness in the estimation of expected sales can be described by membership functions and is given in Exhibit 5, together with the derived membership functions of the products' expected profit. Based on the degree of preference computed in Exhibit 5, product Y is preferred to product X by a risk-seeking decision maker ($\alpha \geq 0.8$) but product X is preferred to product Y by those decision makers who are relatively risk averse or risk neutral ($\alpha \leq 0.5$).

If the company is concerned about the probability of achieving a target profit, the expert will also be required to provide an estimation on the standard deviation of sales. These estimations are again imprecise and are represented by the membership functions in Exhibit 6. The resultant membership functions for Prob($Z \geq Z^\circ$), as shown in Exhibit 6, can be assumed as linear, and the results indicate that product X should be selected for production, regardless of the risk attitude of the decision maker. This decision is contradictory to the case in section 1 where the expert's subjective assessment on E(s) and SD(s) is assumed to be accurately determined.

Therefore, as demonstrated by this example, ignoring fuzziness in decision analysis can lead to erroneous decisions. Since there is fuzziness in the output variable, the decision is not likely to be clear cut. It is important for the decision maker to

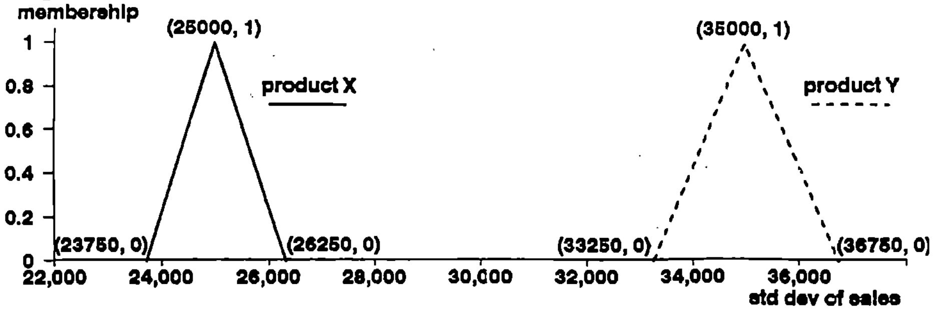
Exhibit 5 Membership Functions of Expected Sales



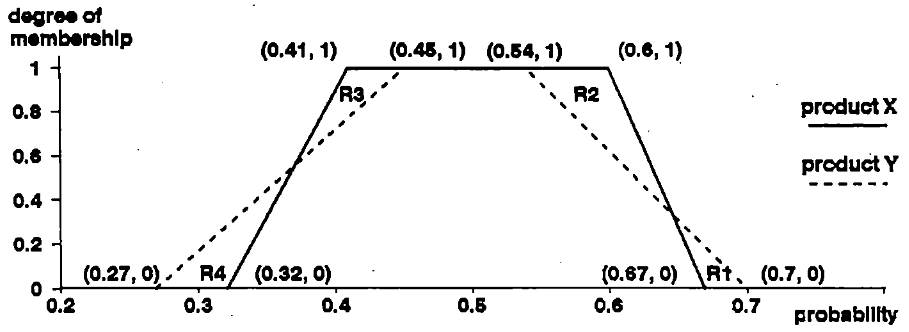
Degree of Preference, $\gamma_{YX} = \dfrac{\alpha A_1 + (1-\alpha)A_3}{\alpha(A_1+A_2) + (1-\alpha)(A_3+A_4)}$

α	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
γ_{YX}	0.06	0.11	0.16	0.22	0.28	0.34	0.41	0.48	0.55	0.63	0.71

Exhibit 6 Membership Functions of Standard Deviation of Sales



Membership Functions of Probability of Achieving a Target Profit of $210,000



$$\text{Degree of Preference, } \gamma_{YX} = \frac{\alpha A_1 + (1-\alpha)A_3}{\alpha(A_1+A_2) + (1-\alpha)(A_3+A_4)}$$

α	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
γ_{YX}	0.45	0.41	0.38	0.34	0.31	0.28	0.25	0.22	0.19	0.16	0.14

evaluate the additional information (γ_{YX} for different values of α) generated prior to determining which product to manufacture.

Fuzziness in Cost-Volume-Profit Analysis

In addition to the fuzziness of the sales demand distribution, the company may not have precise information on the products' selling prices and costs of operations. For instance, the sales expert may believe that the price of product X cannot go below $38.00 ($L_0$) and cannot be above $42.00 ($U_0$). Also, he believes that having a price range of $39.20 ($L_1$) to $40.80 ($U_1$) is very reasonable. Consequently, fuzziness in selling price is involved. Its membership function as well as those of other input variables (unit variable costs, total fixed costs, expected sales and standard deviation of sales) can be constructed with the expert's assistance and are given in Table 2. The resultant membership functions of the products' expected

Table 2
Membership Functions of Price, Cost, Volume and Profit

	L_0	L_1	U_1	U_0
Product X:				
selling price	\$38.000	\$39.200	\$40.800	\$42.000
variable costs	\$25.460	\$26.264	\$27.336	\$28.140
fixed costs	\$2,000,000	\$2,200,000	\$2,200,000	\$2,400,000
expected sales	171,000	176,400	189,000	189,000
S.D. of sales	23,750	25,000	25,000	26,250
$E(Z)$	−\$713,940	−\$107,190	\$547,304	\$1,126,060
$\text{Prob}(Z \geq Z^\circ)$	0.0000	0.1446	0.8212	0.9821
Product Y:				
selling price	\$18.90	\$19.95	\$22.00	\$22.50
variable costs	\$8.10	\$8.55	\$9.18	\$9.45
fixed costs	\$2,000,000	\$2,200,000	\$2,200,000	\$2,400,000
expected sales	180,000	190,000	216,000	220,000
S.D. of sales	33,250	35,000	35,000	36,750
$E(Z)$	−\$618,000	−\$119,500	\$608,920	\$970,000
$\text{Prob}(Z \geq Z^\circ)$	0.0060	0.1977	0.8079	0.9370

profits and the probability of achieving a target profit (e.g. \$210,000) are included in Exhibit 7. The results, by and large, indicate that risk-seeking individuals will select product *X*; the two products are the same to decision makers who are risk neutral; and product *Y* is preferred by risk-averse decision makers.

As can be seen from these examples, when there is fuzziness in the subjective estimates of the input variables, the decision will not be clear cut. The 'fuzziness' in the output variable can have a significant impact on the decision. Thus, it is important to incorporate fuzziness of the independent variable(s) in CVP analysis such that sound decisions can be made.

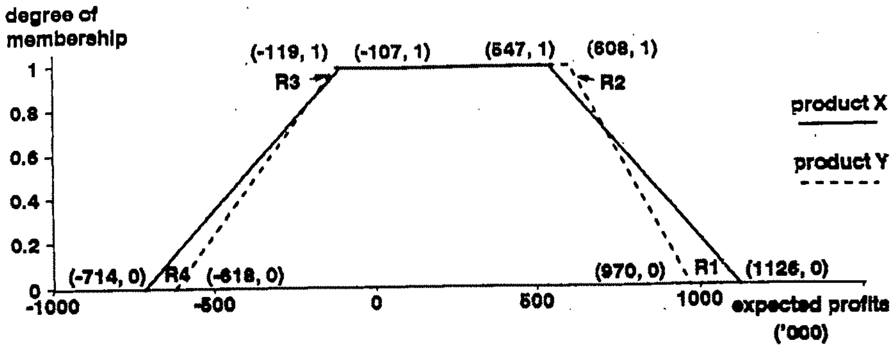
Concluding remarks

Relying on point estimates for decision making can be misleading if fuzziness is deemed to exist. In this case, Fuzzy Set Theory must be applied to handle the imprecision quantitatively. Accordingly, additional information regarding the decision problem is generated to assist management in making sound economic decisions.

Despite the risk of ignoring fuzziness in decision analysis, most managers do not apply Fuzzy Set Theory to their decision problems because they are not familiar with the theory and/or feel that its calculation is too complicated. This can partially be attributed to the extensive use of mathematical notation in the Fuzzy Set Theory literature. In fact, for the examples illustrated in the previous section, the analysis was done on a spreadsheet and the computation time required was less than a minute. Also, the input requirement is reasonable as experts are required to construct the membership function for each independent variable by simply specifying its four parameters: L_0, L_1, U_1 and U_0. These four data points are familiar to managers who usually have an idea of the boundaries and the most reasonable range for the variables of interest. For instance, it is common for most sales managers to indicate that sales will not go below L_0 units; cannot go over U_0 units; and that the most reasonable range is from L_1 to U_1 units. Thus, the generation of the membership function is simple and straight forward as managers are used to specifying ranges. Also, managers are more comfortable with specifying ranges than giving an artificial precise point estimate.

In this paper we have presented an application of Fuzzy Set Theory to a specific decision setting—CVP analysis and selection of alternatives. The methodology is also appropriate for other accounting problems, especially in cases where human judgement is essential. In fact, Fuzzy Set Theory has been applied to internal control judgements (Cooley and Hicks, 1983); materiality judgements (Kelley, 1984); determining the significance of cost variances for investigation (Zebda, 1984); etc. As the theory has provided a mathematical framework wherein imprecise phenomena in decision making can be treated systematically, its application in managerial accounting are numerous, and may include linear programming in product mix decisions, capital budgeting, cost/benefit analysis etc.

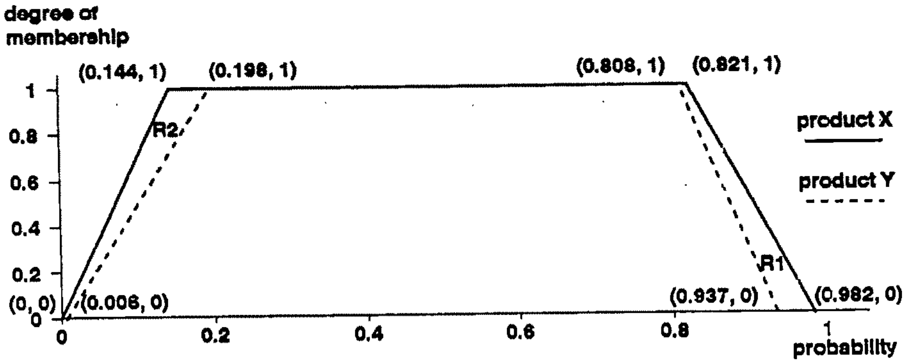
Exhibit 7 Membership Functions of Expected Profits



$$\text{Degree of Preference, } \gamma_{YX} = \frac{\alpha A_2 + (1-\alpha)A_4}{\alpha(A_1+A_2) + (1-\alpha)(A_3+A_4)}$$

α	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
γ_{YX}	0.98	0.86	0.75	0.65	0.56	0.47	0.39	0.32	0.25	0.19	0.13

Membership Functions of Probability of Achieving a Target Profit of $210,000



$$\text{Degree of Preference, } \gamma_{YX} = \frac{(1-\alpha)A_2}{\alpha A_1 + (1-\alpha)A_2}$$

α	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
γ_{YX}	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.00

References

Adar, Z., A. Barnea and B. Lev (1977), 'A Comprehensive Cost-Volume-Profit Analysis Under Uncertainty', *Accounting Review*, January, pp. 137–149.

Baas, S. M. and H. Kwakernaak (1977), 'Rating and Ranking of Multiple–Aspect Alternatives Using Fuzzy Sets', *Automatica*, 13, pp. 47–58.

Bellman, R. E. and L. A. Zadeh (1970), 'Decision-Making in a Fuzzy Environment', *Management Science*, December, pp. 141–164.

Bortolan, G. and A. Degari (1985), 'A Review of Some Methods of Ranking Fuzzy Subsets', *Fuzzy Sets and Systems*, 15, pp. 1–19.

Constantinides, G., Y. Ijiri and R. Leitch (1981), 'Stochastic Cost-Volume-Profit Analysis with a Linear Demand Function', *Decision Sciences*, July, pp. 417–427.

Cooley, J. W. and J. O. Hicks, Jr. (1983), 'A Fuzzy Set Approach to Aggregating Internal Control Judgments', *Management Science*, 29, pp. 317–334.

Dubois, D. and H. Prade (1978), 'Operations on Fuzzy Numbers', *International Journal of Systems Science*, 9, pp. 613–626.

Hannan, E. L. (1981), 'On Fuzzy Goal Programming', *Decision Sciences*, July, pp. 522–531.

Ismail, B. and J. Louderback (1979), 'Optimizing and Satisficing in Stochastic Cost-Volume-Profit Analysis', *Decision Sciences*, April, pp. 205–217.

Jaedicke, R. K. and A. A. Robichesk (1964), 'Cost-Volume-Profit Analysis Under Conditions of Uncertainty', *Accounting Review*, October, pp. 917–926.

Kaplan, R. S. (1982), *Advanced Management Accounting* (Prentice-Hall, New Jersey).

Kaufmann, A. (1975), *Introduction to the Theory of Fuzzy Subsets*, Vol. 1 (Academic Press, New York).

Kelly, L. (1984). 'Formulation of the Accountant's Materiality Decision Through Fuzzy Set Theory', *TIME, Studies in Management Sciences*, 20, pp. 489–494.

Lau, A. H. L. and H. S. Lau (1976), 'CVP Analysis under Uncertainty—A Log Normal Approach: A Comment', *Accounting Review*, January, pp. 163–167.

—— (1987), 'CVP Analysis with Stochastic Price-Demand Functions and Shortage-Surplus Costs', *Contemporary Accounting Research*, Fall, pp. 194–299.

Liao, M. (1975), 'Model Sampling: A Stochastic Cost-Volume-Profit Analysis', *Accounting Review*, October, pp. 780–790.

Luce, R. D. and H. Raiffa (1957), Games and Decisions (Wiley & Sons, New York).

Nakamura, K. (1986), 'Preference Relations on a Set of Fuzzy Utilities as a Basis for Decision Making', *Fuzzy Sets and Systems*, 20, pp. 147–162.

Shih, W. (1979), 'A General Decision Model for Cost-Volume-Profit Analysis Under Uncertainty', *Accounting Review*, October, pp. 687–706.

Watson, S. R., J. J. Weiss and J. L. Donnell (1979), 'Fuzzy Decision Analysis', *IEEE Transactions on Systems, Man, and Cybernetics*, January, pp. 1–9.

Zadeh, L. A. (1965), 'Fuzzy Sets', *Information and Control*, 9, pp. 338–353.

—— (1972), 'A Fuzzy Set Theoretical Interpretation of Linguistic Hedges', *Journal of Cybernetics*, 2, pp. 4–34.

Zebda, A. M. (1984), 'The Investigation of Cost Variances: A Fuzzy Set Theory Approach', *Decision Sciences*, Summer, pp. 359–389.

JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents

March 1990

Vol. 12, Number 4

Editorial Data

Alfred Wagenhofer
Voluntary Disclosure with a Strategic Opponent

Robert E. Verrecchia
Information Quality and Discretionary Disclosure

Samir El-Gazzar and Victor Pastena
Negotiated Accounting Rules in Private Financial Contracts

Myron B. Slovin, Marie E. Sushka and Carl D. Hudson
External Monitoring and Its Effect on Seasoned Common Stock Issues

Advertisements

Financial Accountability & Management

Autumn 1989 Editor: John Perrin Vol. 5 No. 3

Contents

Accounting for Development Projects: The Issues
by PETER N. DEAN

The Advent of Cash Planning
by COLIN THAIN and MAURICE WRIGHT

The Two Worlds of Management Control
by SVERRE HØGHEIM, NORVALD MONSEN, RIGNOR H. OLSEN and OLOV OLSON

Performance Auditing: The Jurisdiction of the Australian Auditor-General: A Note of Clarification
by JOHN J. GLYNN

Monitoring and Auditing Value for Money in the UK: The Scope for Quantitative Analysis—A Comment
by CYRIL TOMKINS

Monitoring and Auditing Value for Money in the UK: The Scope for Quantitative Analysis—A Reply
by PAUL ANAND

Subscriptions

	1989 volume		
	UK only	Overseas sterling	North America and Japan
Institutions, libraries and professional	£35.00	£43.00	$74.00
Teachers or students	£15.00	£18.00	$31.00

Journal of Business Finance & Accounting and *Financial Accountability & Management* (combined rate)

Institutions, libraries and professional	£74.50	£87.00	$149.50
Teachers or students	£34.25	£40.50	$69.50

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford, OX4 1JF, UK. Editorial communications to *Financial Accountability & Management*, Department of Economics, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, England.

Accounting and Business Research, Vol. 20, No. 78, pp. 97–110, 1990

A Model of Information System Choice

Ian Dobbs and Kevin Keasey*

Abstract—The literature on public information system choice (for example, Demski, 1973, 1974) points to the conclusion that the choice of a public information system is inherently chaotic. This conclusion seems to conflict with the actual development of accounting standards. The conflict can be partly explained by the lack of sufficient structure in the frameworks of analysis used in the existing literature. This paper shows that, once certain minimal institutional factors and their effects on preferences, or the perception of such, are included in a model of public information system choice, then such a choice need not be chaotic.

Introduction

Since the work of Demski (1973), there have been a number of articles which have tried to elicit the conditions that individual account user preferences would need to fulfil to ensure the existence of a rational[1] social preference ordering over accounting information systems. As Walker (1984) has clearly shown, individual account user preferences by themselves do not impose enough structure to obtain the desired result of rational social preferences over the set of possible accounting information systems. However, this negative conclusion stems from a model which abstracts from a variety of important real world features. In our view, the existence of incomplete information, costly search, transition costs and consequent inertia would seem to imply that the characteristics of the existing information system will significantly influence and constrain the choice of alternative systems. On this view, the choice problem is one of selecting from a (possibly very small) set of possible modifications or movements away from a pre-existing system. The purpose of this paper is to consider the extent to which this alters the above essentially negative conclusion.

Lessons from related literatures

The prior work in the area of the social choice of an accounting information system has concerned itself with determining the conditions individual account user preferences would need to fulfil for there to be a social ranking of accounting information systems, the social ranking being defined over every point in the overall preference set. The general conclusion from such work is that, unless the individual account user preferences are homogeneous in terms of their beliefs and tastes, there will be no social ranking of accounting information systems which fulfils Arrow's conditions.

The problem to be considered here is related to the above but different in a number of ways. First, information systems are not defined in terms of their fineness[2] but rather in terms of normative information qualities (see Vickrey, 1985)—attributes such as reliability, verifiability, etc., which most accounting practitioners and academics would be readily aware of. Second, the choice of a new information system is regarded as a movement from a pre-existing or *status quo* information system. The institutional factors such as incomplete information, costly search and costs of movement to a new information system will influence individuals' preferences over the choice of alternative information systems. Third, a complete social ranking of information systems is not sought; instead, the conditions needed to ensure the existence of an undominated direction of movement from an existing information system to a new system are examined. To develop and position this framework of analysis, three separate but related literatures are briefly discussed: the accounting information system choice literature; the spatial political choice literature; and the recent developments in the incentive compatibility literature.

The Choice of Accounting Information Systems

The frameworks of analysis used in this literature (Demski, 1973, 1974; Bromwich, 1980; Ohlson and Buckman, 1981; Walker, 1984; Vickrey, 1985) have a number of general and salient features. First, the presence of an existing accounting information system, if its existence is indeed acknowl-

---

*The authors are, respectively, lecturer in economics at the University of Newcastle upon Tyne, and reader in accounting and finance at the School of Industrial and Business Studies, University of Warwick.

[1] Rational in this context is defined in the usual way. That is, the ranking of the alternatives should be complete, transitive and reflexive.

[2] Fineness can be defined in the following way: portray an information system as a partition of the state space. One partition of the state space can be seen as being finer than the other if it provides all the messages of the other and more.

edged, does not affect or bind the choice of a further accounting information system. Rather the choice of accounting information system is allowed to take place from any point in the overall preference set. Instead of this, the model developed here assumes that the presence of an existing accounting information system imposes constraints upon the choice of an alternative accounting information system. This is due to the existence of incomplete and imperfect information, costs of adjustment and perhaps of search.

Bromwich (1980) recognises that the choice of an accounting information system is not frictionless, and that, even with the benefit of complete information, there are adjustment costs. Analysing the possibility of partial accounting standards Bromwich (p. 289) notes that:

> A sequential approach provides one way of structuring activities in the face of constraints on available resources. It also allows the research and the consultations associated with setting individual standards to be decentralised

Thus, Bromwich provides one motivation for this analysis of partial standards by focusing on the fact that simply looking at complete comparisons of information systems omits an essential ingredient in the choice problem.

Second, the majority of the work in the literature, with the exception of Vickrey (1982, 1985), simply defines accounting information systems with respect to their partitioning of the state space and their cost. The partitioning (fineness) concept of information systems is based on the notion that individuals are expected utility maximisers who use information systems to revise their prior probabilities in a Bayesian fashion. From this perspective information systems are compared in terms of their respective 'message' sets. If one information system partitions the state space more finely than another (offers all the messages of the other and more) then, *ceteris paribus*, it is to be preferred. Demski (1973) argues that this partitioning view of information systems is inconsistent with a view of portraying information systems in terms of normative information qualities (NIQs) such as reliability, timeliness, etc. However, Vickrey (1985) argues that Demski's conclusion is based on an extremely restrictive concept of an NIQ, and suggests a variety of qualities which relate to the ability of an information system to revise probabilities: signal relevance, cost effectiveness, act selectivity, state-predictive ability, reliability, representational faithfulness, timeliness and understandability. After demonstrating how these qualities underpin the partitioning concept of information systems, Vickrey then indicates how these qualities compare to the information qualities deemed desirable by the FASB (1980). While Vickrey (p. 128) notes that differences do exist, he concludes as follows:

> The two hierarchies seem more similar than might have been expected given that the FASB's approach to the development of NIQs (normative information qualities) seems to be based more on a working knowledge of decision making in the empirical setting and intuition ... it seems likely that some of IE (information economics) related ideas about NIQs developed herein may apply wholly or in part in the empirical setting.

Thus the arguments of Vickrey demonstrate that the qualities often deemed desirable for information systems, such as reliability and timeliness, need not conflict with, and indeed seem to underpin, the partitioning perspective. Therefore, the perspective adopted here is one where accounting information systems are not chosen on the basis of fineness criteria, but rather via the more fundamental concepts of reliability, understandability, timeliness, etc., where these characteristics might be portrayed as dimensions along which choices can be made.

The model to be developed here, therefore, moves away from the social ranking of information systems defined in terms of their fineness, to a closer representation of the practice of choosing accounting standards. To understand how the practice of choosing accounting standards differs from the models of the existing literature, consider the following quotation from Ashton (1983) concerning the ASC in the UK:

> The ASC approves in advance a long-range programme and the priority that should be given the various topics in the programme. The various stages in the standards setting process can be summarised under the following headings.
>
> (a) Research. It is usual for one or more studies to be commissioned before any work is undertaken on an accounting standard. The researchers may be professional firms, industrial or commercial firms or academics and the aim is to review theory, current practice, authoritative pronouncements and to prepare a bibliography, together with suggestions for possible lines for development.
>
> (b) Drafting sub-committee. A sub-committee is formed after the research is completed to prepare a draft standard. This committee is made up of six to nine members who are nominated by the ASC and every effort is made to ensure that the committee is representative, including members in practice, industry, commerce and academe. The time taken to prepare the draft standard depends

on many factors and particularly on the complexity of the subject matter.

(c) Internal exposure. The draft accounting standard after being reviewed by the ASC is then sent to the technical committees of the governing bodies and to regional groups. The various committees and bodies prepare written comments which are submitted to the drafting committee which then revises the paper in the light of these comments. The revised draft, together with the comments, is then forwarded to the ASC.

(d) Meetings with interested parties. In addition to consulting the various technical committees of the governing bodies, the ASC normally discusses the contents of draft standards with the finance directors and senior officials of companies whose financial statements will be affected by the proposals.

(e) Publication of exposure draft for general comments. The ASC then considers the draft accounting standard after this lengthy consultation procedure and may amend it before authorising its publication as an exposure draft.

(f) Evaluation of comments. The comments are collated by the ASC secretariat and sent to each member of the ASC. A panel is then set up to reconsider these comments. Where there is disagreement between the accountancy bodies on some aspect of the exposure draft, or on the implementation of the proposed standard, the disagreement is resolved through the CCAB.

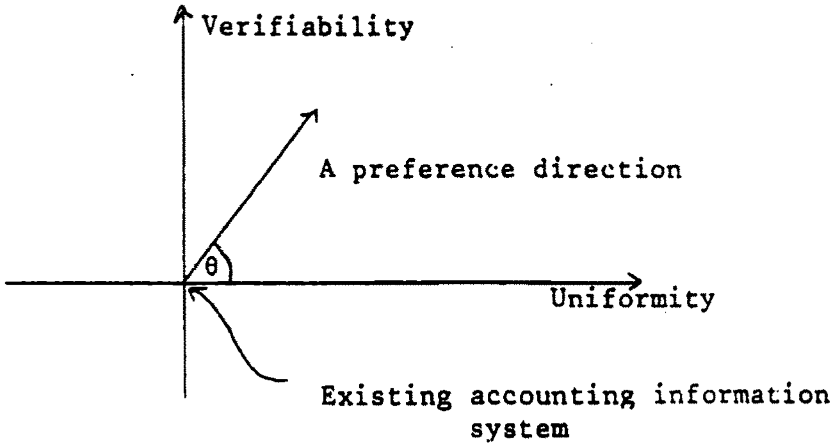
After assessing all the views on the exposure draft the ASC prepares a revised standard and recommends it for adoption by each of the Councils of the six governing bodies. The recommended standard is then discussed by each Council and it is usual for each Council to approve the standard, subject to it being approved by the other five Councils.

The quotation highlights a number of the divergences which exist between actual practice and the frameworks of analysis in the existing literature. First, the accounting body seems to operate under conditions of incomplete information, given its need to establish, via research, the current situation and the possible avenues of development. Second, discussions take place and it is likely that these hinge on consideration of characteristics rather than partitioning arguments. Third, the procedural costs involved in considering a movement are quite high, and it is likely that the actual transformation cost will also be considerable (including individual specific loss of human capital). All of these important institutional factors are in the main omitted from the prior literature.

In our view a model which takes some account of the above observations can be portrayed in outline as follows. Firstly, there is a need to model any accounting information system as being determined by its fundamental accounting characteristics, such as verifiability, uniformity, materiality, fairness, etc. A simple way of modelling these would be to see each one as a continuous dimension. For example, let the dimensions be uniformity and verifiability (Figure 1).

On these dimensions an appropriate normalisation is to place the existing accounting information system/accounting body's existing position/existing set of accounting conventions at the origin. For example, this might be 'historical cost accounting with periodic adjustments'. Changes in the system can then be represented by a vector from the origin in the appropriate direction. Secondly, it is assumed that the accounting body considers only

Figure 1



relatively marginal changes about the extant position. The justification for this rests on the notion of incomplete information. That is, preferences are only likely to be well defined over alternatives relatively close to the extant system, whilst the consequences of large changes will tend to be more conjectural. In view of this, and the probable risk aversion of the accounting body, only relatively small changes will be considered at any point in time. It follows then that the accounting body will be concerned with identifying individuals' preferences over directions of change with the idea of identifying the most preferred direction of change.

Our view is that the ASC is seeking a preferred direction, given the information it can obtain, or is willing to accept, about individual account user preferences over such directions. In practice a vote does not actually take place, but the ASC may be reasonably viewed as operating as an impositional democracy. Such a notion is similar to Demski's (1974, pp. 230–233) dictatorial imposition:

> For example, the SEC, FPC and FCC all influence accounting policies. Further observe that, although we may interpret the decisions of any of these agents as being impositional, we must ultimately recognise that a form of voting is implicitly at work.

Thus, from the information that the ASC receives from interested parties it is able to infer what result a majority vote would give. It is then concerned to find the most preferred direction, a direction which beats an alternative within such a voting procedure (an undominated direction). One problem is that such a direction may not exist; another is that cycles may arise. Clearly, in the latter case the issue is to discover how likely the occurrence of such cycles might be. Intuition suggests that an undominated direction will probably exist in a lot of cases; in the modelling section, we specify some properties that would guarantee this.

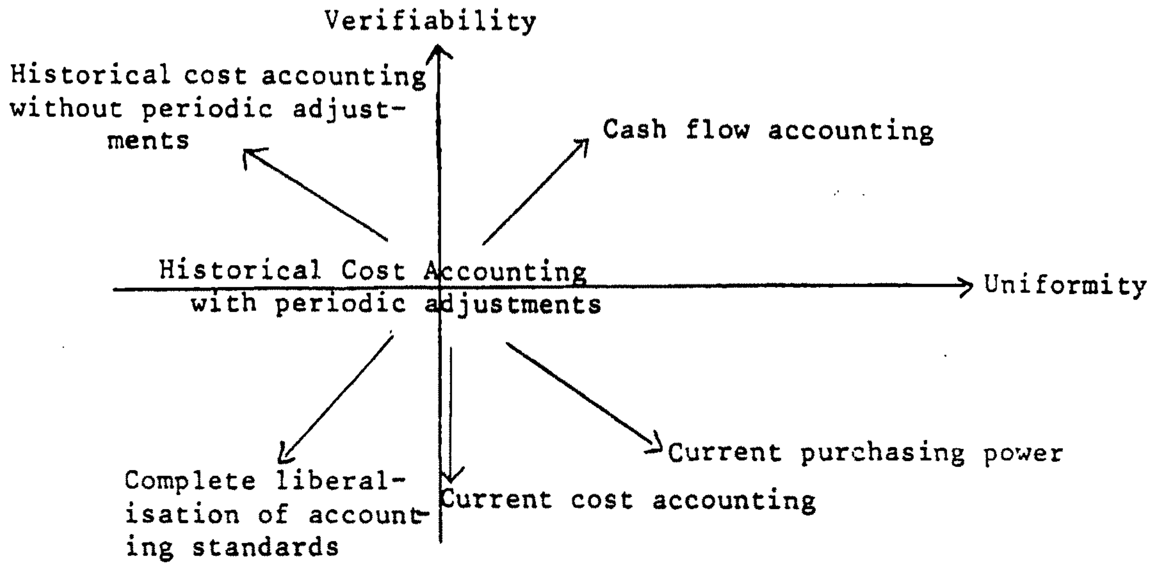
In terms of Figure 1, a possible portrayal of perceived alternatives to an existing accounting information system is presented in Figure 2. It seems reasonable to suppose that individual account users may have a preference for any of these directions, given the subjectively perceived costs involved.

The above framework encompasses to a degree the earlier literature in that any information system can be portrayed in the above type of space because the fundamental notions of verifiability, uniformity, materiality, etc., underpin the partitioning notion. Furthermore, it captures certain important institutional factors which are likely to be relevant for most western economies. However, before developing this model more formally, there are other relevant literatures that need at least brief discussion.

Spatial Political Theory and Incentive Compatibility

The literature emanating from the work of Demski on the impossibility of deriving social rankings of accounting information systems might be thought of as a general application of Arrow's impossibility theorem. In the social choice literature there is a set of work running parallel to that developing from Arrow (1951) that considers the restrictions needed on individual preferences for there to be a majority vote equilibrium, where the issues are portrayed as spatial dimensions. The

Figure 2


Verifiability
Historical cost accounting without periodic adjustments
Cash flow accounting
Historical Cost Accounting with periodic adjustments
Uniformity
Complete liberalisation of accounting standards
Current cost accounting
Current purchasing power

model to be developed in this paper might be considered as being derived from this latter literature, and therefore the general findings of this spatial political choice literature are briefly described.

Since the earliest work on spatial political choice by Black (1948, 1958), Downs (1957) and Buchanan and Tullock (1962), the usual result has been one of disequilibrium. In the earliest, one dimensional spatial models of voting, voters' ideal points are arrayed along a single dimension, and any median of these ideal points must be stable under majority rule (no other point being preferred to it by majority vote). This finding, which we owe to Hotelling (1929), contrasts with the findings of instability in the later multi-dimensional voting models. Plott (1967) proved the critical result that with two (or more) dimensions a majority winning position is extremely unlikely. For a winning position to exist, there had to be, in essence, a multi-dimensional median to the set of preferences. Despite such a negative result, a literature on multi-dimensional spatial competition has developed (see Feld and Grofman, 1987, for a reliable introduction to this rather arcane area of political thought) to the point of showing that unless severe restrictions are imposed, the cycling that results from instability can be driven to any point in the issue space (see McKelvey, 1976; Kramer, 1977). These instability results directly mirror the impossibility results of the literature emanating from Arrow. Just as the Arrow results led to numerous attempts to find conditions sufficient to guarantee a social ranking, a literature has developed that tries to discover why the prevalence of instability in theory does not reflect the stability found in practice.

The attempts to understand why stability of voting outcome is found in practice, although theory suggests otherwise, were brought to the fore by Tullock (1981). Tullock's arguments for why stability might be commonplace were directly concerned with log-rolling over issues; because this does not fit the problem to be addressed here, it is not discussed further. However, a significant empirical and experimental literature indicates that legislatures could be stable even without structural restrictions. McKelvey and Ordeshook (1980) found that experimental traders were, after some learning, largely able to avoid 'inefficient' outcomes. Fiorina and Plott (1978) found similar clustering around the core when it existed, and in one vicinity of the preference space when it did not. Denzau, Mackay and Weaver (1979) have developed a rationale for such stability in the form of 'agenda costs'. They find that the extent of potential instability is considerably reduced with positive agenda costs. Furthermore, Rubinstein (1980) and Shepsle and Weingast (1981) proved that, with only standard assumptions regarding individual preferences, once voters noted they would be voting over issues long term rather than just the immediate vote, there would be a finite and positive number of equilibria.

Another part of the stability literature considers voting behaviour within the presence of binding contracts. Voters in standard voting models have very restricted rights; in particular they are not free to make binding commitments with other members. It is not surprising that in real legislatures, and in experiments, individuals make and keep commitments. McKelvey and Ordeshook's (1980) subjects quickly learned how to negotiate agreements that made the group better off.

The right to make binding agreements can be considered a right to make long-term institutions prior to actual voting. Weingast (1979) makes a 'constitutional' argument that voters recognise the probability of instability due to myopia, and impose long-term 'norms' upon their choices such that everyone is made better off.

Connected to the notion that voters will bind themselves to ensure a better long-term, are the features of procedure and group dynamics which may act either to constrain the number of alternatives or to limit choice to a set of alternatives such that choice from among this set will be acyclic, or at least 'well-behaved' or 'predictable'. Among the features that have been looked at are the rule that requires any motion to defeat the *status quo* before it can be approved, the germaneness rule, and committee structures which impose a division of respectability across multiple issue-dimensions (see Shepsle, 1979; Shepsle and Weingast, 1981, 1982, 1984). More generally attention has been called to the role of leaders and parties instructing the agenda and/or forcing choices into a dichotomous mode (see Downs, 1957; Romer and Rosenthal, 1978).

In addition to voting alternatives being limited by the acts of individuals or groups, cognitive biases may constrain the domain of available alternatives and dimensions. These limitations arise from the proclivity of people to think in customary fashions and mentally to fit new or continued issues into pre-existing categories.

A number of the arguments discussed above see voter perceptions as a function of past actions and voting as taking place within real-time. These arguments can also imply that a potential outcome changes its nature as it moves through the choice process until finally being chosen or rejected. Once an outcome has come to pass, there is associated with it the entire history of its passage. The outcome subsumes the whole set of trades, negotiations, debates and votes which went into its final passage. In addition, as the decision process continues, new information is usually made available, for example on the amount (and intensity) of support for various alternatives. Once an outcome has become a reality, preferences may shift in its favour because of a cognitive dissonance reduction effect, or because of the extreme difficulty and cost of undoing what has already been decided upon, or because of generally agreed norms. In other words, the process of choice itself can alter the characteristics of 'alternatives'. This line of reasoning leads to the conclusion that the set of alternatives is diminished via the process of choice. A paper by DeMeyer and Plott (1970) suggests that an undominated alternative is rather likely with only a few alternatives although it becomes less and less likely as the number of alternatives increases. This point is clearly of some significance in respect of the choice of accounting systems since, as we have already suggested, it may be that the number of 'feasible' alternatives in practice is quite small.

A final strand in the stability literature is concerned with meta-preferences and has been developed by Grofman and Uhlaner (1985). Whilst they list and describe seven types of meta-preferences, only the ones directly relevant to this paper are described here. The first meta-preference they discuss of relevance to this paper is concerned with consensus. They argue that voters may believe that outcomes which have achieved some level of wide support should, as a matter of principle, be supported. Other voters may simply have a low tolerance for disagreement—a voter's preference for consensus may outweigh his or her preference for a specific outcome. A second relevant meta-preference is concerned with uncertainty avoidance. If there is potential cycling, then the ultimate effect of moving from the *status quo* is apt to be quite uncertain. In situations of complexity, with cyclical majorities across multiple dimensions, voters may be very reluctant to 'rock the boat' since there is no guarantee that they will be better off by doing so. Paradoxically, enough instability (of preferences) may imply stability (of outcomes). A third meta-preference is directly connected to decision costs. Insofar as time (and information gathering) is costly, voters may settle for less than ideal alternatives because continuing search would be more expensive than the anticipated gains are worth. Finally, there are real world decisions where there are externally imposed time constraints, so that it becomes necessary to reach a decision. In such situations, there can be considerable costs to changing your mind and considerable advantages to making your mind up quickly. Another meta-preference discussed by Grofman and Uhlaner, and mentioned previously, is concerned with the notion that committee members may be willing to reconcile themselves to particular undesirable outcomes, knowing that in the long run 'things will even out'.

To summarise, the early literature on spatial-political choice suggested that an equilibrium would be unlikely to occur without severe restrictions; later work has developed a number of arguments that 'political outcomes' are likely to be stable in practice. This latter conclusion comes from a general view that a political outcome must be seen as part of a political process where there are costs of movement to and from the current position, where there are reasons (agenda costs, decision costs, political procedures, leadership, cognitive biases, uncertainty avoidance, consensus) why the current position will have a great deal of inertia connected to it and why only a few alternatives will be considered against it.

The model that is proposed in this paper considers the conditions needed to ensure that an accounting body will have an undominated direction of movement for accounting standards that are in themselves defined over dimensions of normative information qualities. Account users are assumed to have preferences over changes in accounting standards from the existing position and the accounting body is assumed to be able to obtain a feel for the distribution of these preferences. However, it is in principle possible that individuals may have incentives to misrepresent their true preferences in their dealings with the accounting body. This is the so-called problem of incentive compatibility, the possible significance of which we now discuss.

The incentive compatibility literature can be seen as having roots in the social choice literature concerned with strategy proof voting. Gibbard (1973) and Satterthwaite (1975) both considered if it was possible to design voting rules which would lead to Pareto optimal outcomes if voters voted in a manner not true to their preferences. They both found that strategy-proof voting mechanisms which are required to satisfy a set of reasonable 'democratic' criteria do not exist. In other words, when preferences are only partly private, it is not possible to design voting rules which lead to desirable social outcomes (for example, Pareto optimality). This result is mirrored in the work of Hurwicz (1973) who proved that in pure exchange economies there exists no allocating mechanism that always yields individually rational Pareto-optimal allocations that are both privacy-respecting (agents in the economy have direct information only about themselves) and individually incentive-compatible (such that all agents telling the truth is a Nash equilibrium).[3] This problem of incentives to misrepresent preferences when preferences are privately known led to two separate literatures which searched for mechanisms which would lead to truthful preference revelation. First, the Demand-Revealing literature emanating from Groves (1973) had led to a number of 'taxes' that would lead to truthful preference revelation. However, these taxes have a number of problems: they may not be individually rational, in that individuals may end up worse off, and they are still open to manipulation by coalitions. Second, Maskin (1979, 1980) and Peleg (1978) have considered what set of game rules, given the possibility of preference misrepresentation, would lead game players to reveal their preferences to a social planner such that he or she could implement optimal outcomes. Although this area of work is still relatively undeveloped, Maskin has shown that, if the Nash concept of equilibrium is used, then social choice rules satisfying no veto cannot generally be implemented if the number of alternatives is greater than three.

---

[3] A Nash equilibrium exists when each person is maximising his utility, given the behaviour of others.

One general conclusion to be drawn from the above literatures is that there is fundamental conflict between mechanism attributes such as equilibria optimality, incentive compatibility of rules, and the presence of information decentralisation/incompleteness. However, for the present paper the question arises as to whether the problem considered by these literatures is of empirical interest. Schotter (1980) argues that in many recurrent preference revelation problems, agents do not resort to manipulation because a social convention is created in which truth telling is an equilibrium. In the current context of standard setting where the process is recurrent, where account users will only be imperfectly aware of each other's preferences, where preferences can be adjusted/changed through the process of choice and where there are decision costs/uncertainty avoidance, it seems rather doubtful whether untruthful preference revelation will be a problem in practice.

The model

An accounting information system can be generally portrayed as a vector in R^n where each dimension represents a separate normative information quality. In this section, to increase intuition, we present the model in R^2; a more rigorous treatment of the R^n case is developed in the appendix. We have argued that the relevant representation of an individual's preferences is over directions of movement. In R^2 a preference direction may be completely characterised by the single variable θ (see Figure 1).

An individual is assumed to have a preference function $P(\theta)$ over directions θ with the following properties:

A1 $P(\theta) = P(\theta + 2n\pi)$, n integer

A2 $P(\theta) > 0 \Leftrightarrow$ the individual prefers direction θ to the existing accounting information system. $P(\theta) = 0 \Leftrightarrow$ indifference.

A3 Single peakedness and monotonicity. $P(\theta)$ attains a unique maximum on the interval $[0, 2\pi]$ at θ_p, such that
$\theta_p \in [0, 2\pi]$
$P'(\theta) > 0$ for $\theta_p - \pi < \theta < \theta_p$ and
$P'(\theta) < 0$ for $\theta_p < \theta < \theta_p + \pi$.

A4 'Peak' symmetry: $P(\theta_p + \delta) = P(\theta_p - \delta)$ for all δ, $0 \leqslant \delta \leqslant \pi$.

Properties A1 and A2 are purely definitional. A3 proposes that there is a most preferred direction and that preference is strictly increasing on $(\theta_p - \pi, \theta_p)$, strictly decreasing on $(\theta_p, \theta_p + \pi)$. This seems fairly unobjectionable, but property A4 is clearly a rather more restrictive assumption. It parallels the assumption often used in the public choice literature that individuals 'weight' dimensions equally (see Hinich and Ordeshook, 1980); this allows a suitable transformation of the coordinate system to realise the symmetry property.

Given any two proposals, $\theta_1, \theta_2 \in [0, 2\pi]$, $(\theta_1 > \theta_2)$, an individual with preference direction θ_p will vote for θ_1 in preference to θ_2 if θ_p is 'nearer' to θ_1 i.e.:

$$P(\theta_1) > P(\theta_2) \quad \text{iff} \quad \frac{\theta_1 + \theta_2}{2} < \hat{\theta} < \frac{\theta_1 + \theta_2}{2} + \pi, \qquad (1)$$

$$P(\theta_2) > P(\theta_1) \quad \text{iff} \quad \frac{\theta_1 + \theta_2}{2} - \pi < \hat{\theta} < \frac{\theta_1 + \theta_2}{2}, \qquad (2)$$

with indifference if

$$\hat{\theta} = \frac{\theta_1 + \theta_2}{2} \quad \text{or} \quad \frac{\theta_1 + \theta_2}{2} + \pi.$$

Referring to Figure 3, notice that the angle $(\theta_1 + \theta_2)/2$ bisects the two proposal directions; depending upon which half-space θ_p locates in, we obtain the relevant preference ordering for θ_1, θ_2 as above. Thus, if θ_p locates above the line AB, $P(\theta_2) > P(\theta_1)$, whilst if below, then $P(\theta_1) > P(\theta_2)$.

It is assumed that the distribution of individuals' preferred directions may be characterised by a density function $g(\theta)$ which is assumed continuous with $g(\theta) = g(\theta + 2n\pi)$ for n integer, such that

$$\int_0^{2\pi} g(\theta)\,\mathrm{d}\theta = 1. \qquad (3)$$

Thus

$$\int_\alpha^\beta g(\theta)\,\mathrm{d}\theta \qquad (4)$$

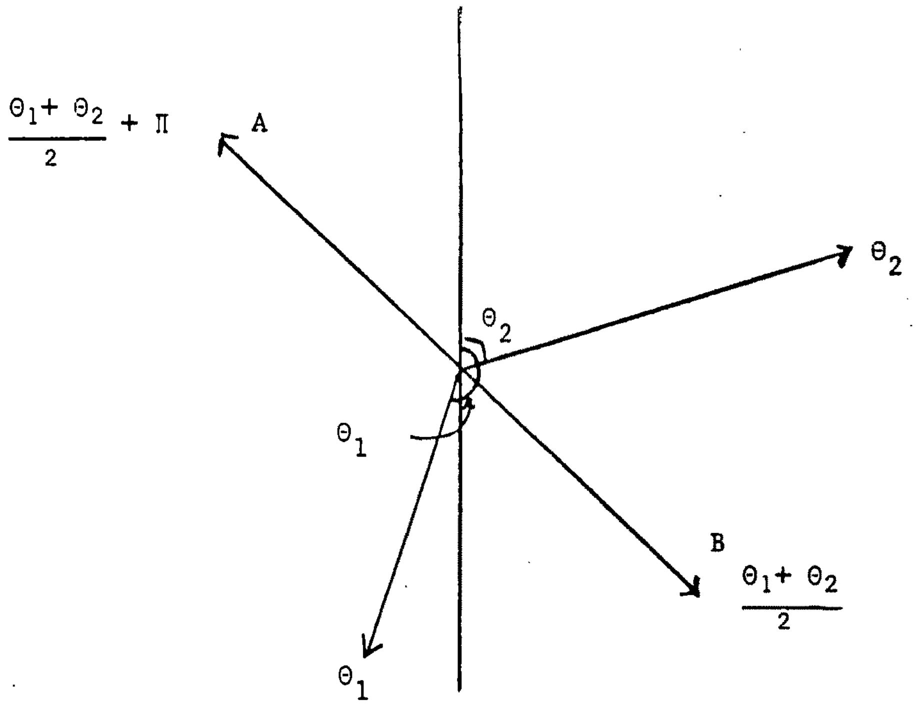
represents the proportion of agents having preferred directions lying in the range $[\alpha, \beta]$. A direction θ will be preferred to the existing accounting information system by majority vote if:

$$z(\theta) \equiv \int_{\theta - \pi/2}^{\theta + \pi/2} g(\tau)\,\mathrm{d}\tau > 0.5. \qquad (5)$$

It follows that there are no majority preferred directions of change (in comparison to the *status*

P,6460

Figure 3



$\frac{\theta_1+\theta_2}{2}+\pi$
A
θ_2
θ_2
θ_1
B
$\frac{\theta_1+\theta_2}{2}$
θ_1

quo) if, and only if, for all $\theta \in [0, 2\pi]$, $z(\theta) = 0.5$. The existing accounting information system is thus retained when the distribution of preferred directions over $[0, 2\pi]$ is radially symmetric. To see this, note that $z(\theta) = 0.5$ for $\theta \in [0, 2\pi]$ entails $z'(\theta) = 0$ on $[0, 2\pi]$ and since, from (5), $z'(\theta) = g(\theta + \pi/2) - g(\theta - \pi/2)$, it follows that $g(\theta) = g(\theta + \pi)$ for $\theta \in [0, 2\pi]$.

It proves useful to define:

$$y(\theta) \equiv z(\theta + \pi/2) \equiv \int_{\theta}^{\theta+\pi} g(\tau)\, d\tau. \tag{6}$$

Note that, from (3) and (6),

$$y(\theta) + y(\theta + \pi) = 1. \tag{7}$$

Then, from (5), for any two proposals θ_1, θ_2, $\in [0, 2\pi]$ such that $\theta_1 > \theta_2$, a majority will prefer proposal θ_1 to θ_2 if

$$y\left[\frac{\theta_1 + \theta_2}{2}\right] > 0.5 \tag{8}$$

since all individuals with preference direction θ satisfying

$$\frac{\theta_1 + \theta_2}{2} < \theta < \frac{\theta_1 + \theta_2}{2} + \pi$$

will vote for θ_1 (see Figure 3). Equally, if the inequality in (8) is reversed, θ_2 is preferred to θ_1. We can now define an undominated direction.

Definition 1: A proposal θ_p is said to be *undominated* if, for all $\theta \in [0, 2\pi]$,

$$y\left[\frac{\theta_p + \theta}{2}\right] > 0.5 \quad \text{for} \quad \theta < \theta_p,$$

$$y\left[\frac{\theta_p + \theta}{2}\right] < 0.5 \quad \text{for} \quad \theta > \theta_p.$$

That is, θ_p beats all other possible directions by majority vote. Now, it is possible to identify certain characteristics that an undominated proposal must possess as follows.

From definition 1 and the continuity of the function y, we must have

$$y(\theta_p) = 0.5. \tag{9}$$

This implies that a necessary condition for θ_p to be undominated is that proposals orthogonal to θ_p must be indifferent to the existing accounting information system. Since y is differentiable, it also follows that:

$$y'(\theta_p) = g(\theta_p + \pi) - g(\theta_p) < 0. \tag{10}$$

This requires that the 'net' density at the point θ_p in favour of the proposal θ_p be positive.

Clearly, if an undominated proposal exists, it is unique. This follows from definition 1. If θ_p denotes the undominated direction, then θ_p is preferred to θ by majority vote for all $\theta \in [0, 2\pi]$, $\theta \neq \theta_p$. Thus, suppose that θ_a is some other undominated proposal; then from definition 1, we must have θ_a which is preferred to θ_p by majority vote, and there is a contradiction.

An undominated direction will not always exist. Yet it seems that, if there is some 'bunching' of density in favour of a particular set of directions, such a direction will often exist. Let

$$h(\theta) = g(\theta) - g(\theta + \pi). \tag{11}$$

Thus h is continuous and $h(\theta) = -h(\theta + \pi)$. $h(\theta)$ may be interpreted as 'net' density in favour of a direction θ.

Theorem: If h is single peaked at θ_0 and is strictly monotonically increasing on $(\theta_0 - \pi, \theta_0)$ and decreasing on $(\theta_0, \theta_0 + \pi)$, then there exists a unique undominated direction.

From (11) and the single peakedness assumption, clearly h attains a unique minimum at $h(\theta_0 + \pi)$. To prove the theorem, we first show that y has both a unique maximum and minimum and is strictly monotonic between. First note that, from (10), $y'(\theta) = -h(\theta)$. By continuity and monotonicity, h has just two zeros: $h(\theta_o) > 0$, $h(\theta_0 + \pi) < 0$, so there exists some $\hat{\theta}$, $\theta_0 < \hat{\theta} < \theta_0 + \pi$ such that $h(\hat{\theta}) = 0$ and $h(\hat{\theta} + \pi) = 0$. Hence there are at least two zeros on $[0, 2\pi]$. There cannot be more, as this would contradict single peakedness of h (by the mean value theorem, more zeros imply more points at which $h'(\theta) = 0$). Hence $y'(\hat{\theta}) = y'(\hat{\theta} + \pi) = 0$ and by monotonicity of h, $y'(\theta) > 0$ for $\hat{\theta} < \theta < \hat{\theta} + \pi$ and $y'(\theta) < 0$ for $\hat{\theta} + \pi < \theta < \hat{\theta} + 2\pi$. Thus y has similar properties to h, attaining its unique maximum at $\hat{\theta} + \pi$, minimum at $\hat{\theta}$ (see Figure 4).

Now $y(\theta) + y(\theta + \pi) = 1$, hence $y(\hat{\theta} + \pi) > 0.5$, $y(\hat{\theta}) < 0.5$ and, by continuity, there is some $\tilde{\theta}$, $\hat{\theta} < \tilde{\theta} < \hat{\theta} + \pi$ for which $y(\tilde{\theta}) = 0.5$ and $y(\tilde{\theta} + \pi) = 0.5$. Again, there cannot be other points for which $y = 0.5$, as this would contradict single peakedness of h. Thus $y(\theta) > 0.5$ for $\tilde{\theta} < \theta < \tilde{\theta} + \pi$ and hence $\tilde{\theta} + \pi$ is an undominated direction.

The above sufficient condition requires that net voting preferences tend to 'bunch' in some particular region. The bunching has to be monotonic but it need not be symmetric about θ_0. In general, if the function h is asymmetric about θ_0, then the undominated direction θ_d ($= \tilde{\theta} + \pi$ in the above) will differ from θ_0 but if h is symmetric, $\theta_d = \theta_0$. The former case is illustrated in Figure 4.

Discussion

The model of accounting information system choice presented in this paper contains more structure than usual via the inclusion of certain salient institutional factors. Within this model, we have already shown that, for the R^2 case, if individuals have symmetrically single peaked preferences over directions of movement from the existing accounting information system and if the overall distribution of individual preferences has a single peak, then an undominated direction will exist. It must be noted that, although the accounting

Figure 4

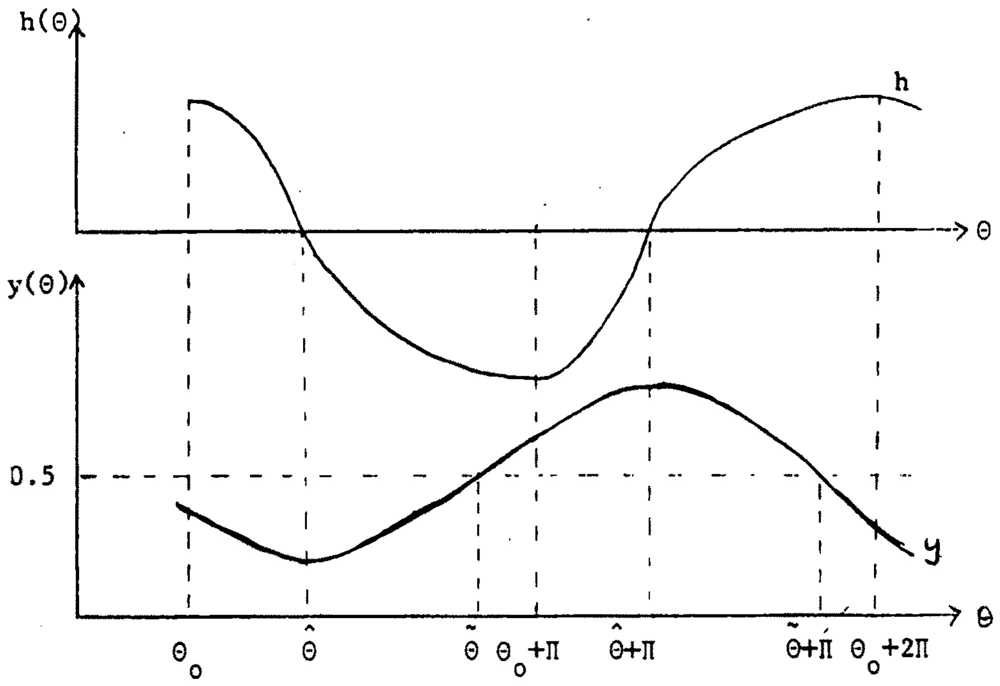
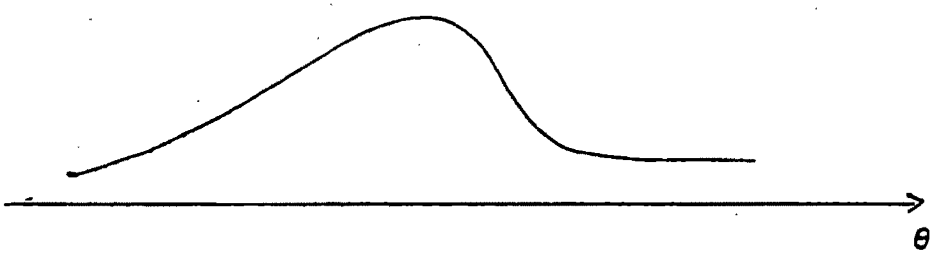


Figure 5



information systems are defined over R^2, the preferences over directions of change from an existing accounting information system or the perception of such are effectively defined over R^1. The required single-peakedness of the overall preference distribution could thus be portrayed as in Figure 5.

As indicated in an earlier section, spatial political theorists have long since established[4] that if two-party political competition is over a single-dimension and if individuals' preferences are single peaked then the competition will have an equilibrium at the median. Such a result is directly analogous to our R^2 undominated direction result. It is worth emphasising, however, that although the results are analogous, the underlying frameworks are not. In the spatial political model, two parties compete for votes in a system where prior party positions count for nothing and where information is complete and perfect. The model presented in this paper for the social choice of accounting information systems is one where the existing position of a single national accounting body and incomplete information are important determining forces. Although the underlying frameworks differ, they have an important factor in common. In both models it is the single peakedness assumption about individual preferences and the distribution of such preferences which enables the desired result to be obtained.

As indicated earlier, when spatial theorists generalised their work beyond R^1 they found that the single peaked individual preference assumption was not sufficient to guarantee the existence of an equilibrium:

> The existing sufficient conditions for a majority rule equilibrium if the domain of social choice is a single issue (unidimensional), require that citizens have single-peaked preferences. If we define the domain of social choice over many issues (multidimensional) then present models require, typically, that the citizens' most preferred positions be distributed symmetrically about the mean preference and the citizens' utility functions also satisfy certain symmetry properties. (Hinich, Ledyard and Ordeshook, 1973, p. 155)

Thus, the spatial theorists have found that, in a multi-dimensional setting, strong symmetry conditions are required in order to demonstrate the existence of political equilibria.[5] A similar result has been derived for the model presented in this paper (see appendix). A sufficient condition for existence in a space with a dimensionality higher than R^2 is that the overall preference distribution is single peaked and symmetrically decreasing from the peak.[6]

It might be argued that the conditions required for an undominated direction to exist are so restrictive that it is unlikely that such a direction would exist. Whilst there is a degree of truth in this, it must be remembered that the model is supposed to capture the process that the national accounting body is involved in when it conducts its 'as if' majority votes. The model presented here attempts to represent a 'political process' that is very different from that underpinning earlier work in the literature (for example, Demski, 1972, 1973). In the earlier literature the process, as it existed, might be portrayed as a perfectly informed entity trying to find a set of standards that will always rank alternatives in accordance with the preferences and beliefs of expected utility maximisers, where the expected utility maximisers are perfectly informed and purely concerned with their own beliefs and preferences. In contrast, in the present model individuals' preferences are not completely individually determined. Rather they have the potential to influence one another and be influenced by the process of standard setting. Furthermore, the standard setting body learns about these preferences through a process of discussion and debate, which in itself informs and has the potential to change the underlying preferences.

---

[4] Downs (1957) derived the result that the median is usually preferred by some majority of individuals if the policy space is uni-dimensional and the individual preferences are single-peaked.

[5] McKelvey and Wendell (1976) provide global theorems which yield the wide class of symmetry results due to previous authors as special cases.

[6] The multi-dimensional spatial result is that a Condorcet equilibrium will only exist if there is a total median. A total median only exists for such spaces if preferences are single-peaked and symmetric about the ideal point. A total median is defined as a point whose projection on to any one-dimensional cross-section of the policy space is a median 'ideal point' for that cross-section. Such a result is directly analogous to our undominated direction to exist for dimensionalities greater than R^2. For an undominated direction to exist for dimensionalities greater than R^2, a total median must exist.

The characteristics of the model presented here and its differences compared with those of previous models reflect some of the developments made in the regulation literature (see Besanko and Sappington, 1987, for a useful survey). The optimal regulatory policy when the regulator is perfectly informed is well established and documented (see Panzar, 1976). However, the more likely situation of the regulator being less than perfectly informed has only recently been the subject of research. The general conclusion to be drawn from the research to date, not surprisingly, is that the optimal policies under situations of incomplete information are somewhat different from those achieved under complete information. Besanko and Sappington (p. 70) conclude as follows:

> As complex as some of the formal models in this literature are, the problems considered pale in comparison to those that must be solved before our understanding of and prescriptions for regulatory policy are complete.... Knowing the functional form of the firm's cost function, the probability structures, and the complete set of all possible contingencies constitutes a great deal of information. In practice, regulators' information is unlikely to be so expansive; thus, communication and contracting... will be more problematic than is generally depicted in these Bayesian formulations.

Thus the conclusion to be drawn from the regulation literature is that, in the presence of incomplete and private information, the task of the regulator is complex and necessitates extensive communication. The model presented here attempts to model the similar situation facing the national accounting body. The underpinnings of the model are further complicated, however, by the political nature of the standard setting process.

The view of standard setting taken in this paper is one of a continuing activity that is not resolved once and for all. The system of standards evolves in a piecemeal fashion; the standard setters, the account users and the preparers of accounts continue to inform each other and adjust their views until a decision is finally reached. This view of the political process underpinning standard setting can be seen as essentially similar to that of Rousseau (1913). While Rousseau felt that democratic government in an executive sense was an ideal highly unlikely to be realised in most societies, he thought that the people could be directly involved in the making of general laws. The legislative process would be characterised by discussion and debate in order to determine what laws are in the general interest. Contemporary theories of participation, like Rousseau's, depend to a large extent on man's nature being 'moralised' by the process of democratic consultation and social interaction. The political process is not just a machine for generating satisfactions but is also educative. Basically, we are arguing that the standard setting process takes place in the general context of democratic society where co-operation and fraternity are deemed to be worthwhile values. The process of evaluating standards creates an environment, given the nature of preferences and their potential for change, which helps to engender their very adoption.

Given this general framework, the accounting body is modelled as trying to choose an undominated direction on the basis of the information it is provided with. This implies that, if there is some pressure towards, or agreement on, a direction of change, and if the disagreement about this direction is roughly equally balanced, then the accounting body should be able to identify this as the undominated direction for change. In terms of standard setting, the interests of the financial statement preparers and users are unlikely to be in agreement as regards potential changes in the standards. It is more likely to be the case that their interests would be in direct opposition. However, as already argued, if this opposition of interests is equally balanced then an undominated direction of change may be achievable. Clearly, in this process, if a true representation is to be achieved, then account users should be as well represented as account preparers amongst the information providers:

> The standard setting body should be made up mainly of accountants but with the wider public interest... should be more clearly recognised... this recommendation is very much in line with developments in the USA where non-accountants are involved in developing accounting standards as members of the... (FASB). (Ashton, 1983, p. 222)

Conclusion

For a number of years the academic accounting literature has shown an interest in how a society might rationally choose an accounting information system. However, the importation of rational economic man as portrayed by public choice theory (compared to the more general views of man portrayed in politics and political science) and the highly abstract nature of the framework, has meant that there has been insufficient structure for 'society' rationally to choose an accounting information system. The problem discussed in this paper is related to the one considered in the earlier literature but it differs in that it considers the conditions needed for an accounting body to have an undominated direction of movement, in terms of the information qualities underpinning accounting standards, from an existing position. This paper has presented a model which contains a minimal institutional structure and it has shown that the conditions for a non-random choice of an accounting information system are that there must be some agreement amongst the account users on how they would like to see the present system change and the disagreement which exists must be 'in balance'.

Thus, the accounting system choices which may face the majority of accounting bodies in the western economies may not be as problematic, given the necessary processes involved with standard setting, as the choice situation portrayed in the literature emanating from Demski. The existence of a national accounting body coupled with the presence of incomplete information offers a structure where equal and opposite forces or, perhaps more importantly the perception of them, have a determinate influence on the choice situation.[7] The interesting empirical question which this result raises is how the institutional framework of pressure groups, lobbying, media persuasiveness and the past accounting change influence individual account user preferences and the accounting body's perception of them.

References

Arrow, (1951), *Social Choice and Individual Values*, John Wiley.

Ashton, R. K. (1983), *UK Financial Accounting Standards: A Descriptive and Analytical Approach*, Woodhead-Faulkner Ltd.

Besanko, D. and Sappington, D. E. M. (1987), *Designing Regulatory Policy with Limited Information*, Harwood Academic Publishers.

Black, D. (1948), 'On the Rationale of Group Decision Making', *Journal of Political Economy*, vol. 56, pp. 57–71.

Black, D. (1958), *The Theory of Committees and Elections*, Cambridge University Press.

Bromwich, M. (1980), 'The Possibility of Partial Accounting Standards', *Accounting Review*, vol. LV, pp. 288–300.

Buchanan, J. and Tullock, G. (1962), *The Calculus of Consent*, University of Michigan Press.

Cushing, B. E. (1977), 'On the Possibility of Optimum Accounting Principles', *Accounting Review*, vol. 52, no. 2, pp. 308–321.

DeMeyer, F. and Plott, C. R. (1970), 'The Probability of a Cyclical Majority', *Econometrica*, vol. 38, pp. 345–354.

Demski, J. S. (1973), 'The General Impossibility of Normative Accounting Standards', *Accounting Review*, vol. 48, pp. 718–723.

Demski, J. S. (1974), 'Choice Among Financial Reporting Alternatives', *Accounting Review*, vol. 49, pp. 221–232.

Denzau, A., Mackay, R. and Weaver, C., 'The Possibility of Majority Rule Equilibrium with Agenda Costs', WP CE79-11-1, *Virginia Polytechnic Institute*, Blacksburg, VA.

Downs, A. (1957), *An Economic Theory of Democracy*, Harper and Row, New York.

Feld, S. L. and Grofman, B. (1987), 'Necessary and Sufficient Conditions for a Majority Winner in N-Dimensional Spatial Voting Games: An Intuitive Geometric Approach', *American Journal of Political Science*, vol. 31, pp. 709–728.

Financial Accounting Standards Board (1983), *Statement of Financial Accounting Concepts No. 2: Qualitative Characteristics of Accounting Information*, Financial Accounting Standards Board.

Fiorina, M. P. and Plott, C. R. (1983), 'Committee Decisions under Majority Rule: An Experimental Study', *American Political Science Review*.

Gibbard, A. (1973), 'Manipulation of Voting Schemes: A General Result', *Econometrica*, vol. 41, pp. 581–601.

Groves, T. and Ledyard, J. O. (1977), 'Some Limitations on Demand Revealing Processes', *Public Choice*, special supplement, pp. 107–124.

Grofman, B. and Uhlaner, C. (1985), 'Meta-preferences and the Reasons for Stability in Social Choice: Thoughts on Broadening and Clarifying the Debate', *Theory and Decision*, vol. 19, pp. 31–50.

Groves, T. (1973), 'Incentives in Teams', *Econometrica*, vol. 41, pp. 617–631.

Groves, T. (1979), 'Efficient Collective Choice when Compensation is Possible', *Review of Economic Studies*, vol. 46, pp. 227–271.

Hinich, M. J. and Ordeshook, P. C. (1970), 'Plurality Maximization versus Vote Maximization: A Spatial Analysis with Variable Participation', *American Political Science Review*, pp. 772–791.

Hinich, M. H., Ledyard, J. and Ordeshook, P. C. (1973), 'A Theory of Electoral Equilibrium: A Spatial Analysis Based on the Theory of Games', *Journal of Politics*, vol. 35, pp. 154–193.

Holmström, B. and Myerson, R. B. (1983), 'Efficient and Durable Decision Rules with Incomplete Information', *Econometrica*, vol. 512, pp. 1799–1819.

Hotelling, H. (1929), 'Stability in Competition', *Economic Journal*, vol. 39, pp. 41–57.

Hurwicz, L. (1973), 'The Design of Mechanisms for Resource Allocation', *American Economic Review*, vol. 63, pp. 1–30.

Kramer, G. H. (1977), 'A Dynamic Model of Political Equilibrium', *Journal of Economic Theory*, vol. 16, pp. 310–334.

Maskin, E. (1979), 'Nash Equilibrium and Welfare Optimality', *Mathematics and Operations Research*.

Maskin, E. (1980), 'On Game Forms and Social Welfare, Functions when Preferences are Restricted', *Review of Economic Studies*.

McKelvey, R. (1976), 'Intransitivities in Multidimensional Voting Models and Some Implications for Agenda Control', *Journal of Economic Theory*, vol. 12, pp. 472–482.

McKelvey, R. and Wendell, R. (1976), 'Voting Equilibria in Multi-Dimensional Choice Spaces', *Mathematics of Operations Research*, vol. 1, pp. 144–158.

McKelvey, R. and Ordeshook, P. (1980), 'Vote Trading: An Experimental Study', *Public Choice*, vol. 35, pp. 151–184.

Myerson, R. B. (1983), 'Mechanism Design by an Informal Principle', *Econometrica*, vol. 51, pp. 1767–1797.

Ohlson, J. A. and Buckman, A. G. (1981), 'Toward a Theory of Financial Accounting: Welfare and Public Information', *Journal of Accounting Research*, vol. 19, pp. 339–455.

Panzar, J. C. (1976), 'A Neoclassical Approach to Peak Load Pricing', *Bell Journal of Economics*, vol. 7, pp. 521–530.

Peleg, B. (1978), 'Consistent Voting Schemes', *Econometrica*, vol. 46, pp. 153–169.

---

[7] Because the accounting body is dealing with its own perception of the distribution of account user preferences, all it really needs is some feeling of bunching for some particular direction and notion of rough balance for directions orthogonal to this in order to identify what it considers to be, effectively, the undominated direction.

Plott, C. R. (1967), 'A Notion of Equilibrium and its Possibility under Majority Rule', *American Economic Review*, vol. 67, pp. 787–806.

Riker, W. H. and Ordeshook, P. C. (1973), *An Introduction to Positive Political Theory.*

Romer, T. and Rosenthal, H. (1978), 'Political Resource Allocation, Controlled Agendas and the *Status Quo*', *Public Choice*, vol. 33, pp. 27–43.

Rousseau, J. J. (1913), *The Social Contract and Discourses*, edited by G. D. H. Cole, Dent, London.

Rubinstein, A. (1980), 'Stability of Decision Systems under Majority Rule', *Journal of Economic Theory*, pp. 150–159.

Satterthwaite, M. A. (1975), 'Strategy-Proofness and Arrow's Conditions: Existence and Correspondence Theorems for Voting Procedures and Social Welfare Functions', *Journal of Economic Theory*, vol. 10, pp. 187–217.

Schotter, A. (1980), *The Economic Theory of Social Institutions*, Cambridge University Press.

Shepsle, K. A. (1979), 'Institutional Arrangements and Equilibrium in Multidimensional Voting Models', *American Journal of Political Science*, vol. 23, pp. 27–59.

Shepsle, K. A. and Weingast, B. R. (1981), 'Structure-Inducement Equilibrium and Legislative Choice', *Public Choice*, vol. 37, pp. 503–519.

Shepsle, K. A. and Weingast, B. R., 'Institutionalising Majority Rule: a Social Choice Theory with Policy Implications', *American Economic Review*, vol. 72, pp. 367–387.

Shepsle, K. A. and Weingast, B. R. (1984), 'Uncovered Sets and Sophisticated Voting Outcomes with Implications for Agenda Institutions', *American Journal of Political Science*, vol. 28, pp. 49–74.

Tideman, T. N. and Tullock, G. (1976), 'A New and Superior Process for Making Social Choices', *Journal of Political Economy*, vol. 84, pp. 1145–1159.

Tullock, G. (1981), 'Why So Much Stability?' *Public Choice*, vol. 37, pp. 184–202.

Vickrey, D. (1982), 'Reflections on the Demski-Chambers Debate Concerning the Existence of a Normative Accounting Standard', *Quarterly Review of Economics and Business.*

Vickrey, D. (1985), 'Normative Information Qualities: A Contrast Between Information-Economics and FASB Perspectives', *Abacus*, vol. 21, pp. 115–129.

Walker, M. (1984), 'Risk Attitudes, Value Restricted Preferences and Public Choice over Lotteries and Information Systems', *Accounting Review*, vol. 59, pp. 278–286.

Weingast, B. R. (1979), 'A Rational Choice Perspective on Congressional Norms', *American Journal of Political Science.*

Appendix

The results for R^2 developed in the text are extended here to the general case. Preference directions are now represented by a unit vector $\mathbf{x} \in \mathbf{R}^n$. Thus, $|\mathbf{x}| = 1$, where $|\mathbf{x}|$ denotes the norm of $\mathbf{x}$. As before, the null vector $\mathbf{O} \in \mathbf{R}^n$ represents the *status quo*. The individual's preference function is denoted $P(\mathbf{x})$; properties equivalent to A2–A4 in the text are as follows:

A(i) $P(\mathbf{x}) > 0 \Leftrightarrow$ the individual prefers $\mathbf{x}$ to the *status quo*, $\mathbf{O}$. $P(\mathbf{x}) = 0 \Leftrightarrow$ indifference.

A(ii) Single peakedness: $P(\mathbf{x})$ attains a unique maximum at $\mathbf{x}_p$.

A(iii) Peak symmetry:

$$\mathbf{x}_p \cdot \mathbf{x}_1 \gtreqless \mathbf{x}_p \mathbf{x}_2 \Leftrightarrow P(\mathbf{x}_1) \gtreqless P(\mathbf{x}_2)$$

(where all vectors satisfy $|\mathbf{x}| = 1$).

Note that the angle between two unit vectors is given by the formula $\cos\theta = \mathbf{x}_1 \cdot \mathbf{x}_2$. Hence the product $\mathbf{x}_1 \cdot \mathbf{x}_2$ may be used to represent angular distance; for example, if $\mathbf{x}_1 = \mathbf{x}_2$, $\mathbf{x}_1 \cdot \mathbf{x}_2 = 1$, if $\mathbf{x}_1 = -\mathbf{x}_2$, then $\mathbf{x}_1 \cdot \mathbf{x}_2 = -1$, whilst if they are orthogonal, $\mathbf{x}_1 \cdot \mathbf{x}_2 = 0$. Thus, A(iii) merely expresses the idea that an individual prefers a proposal if the angle between it and his or her most preferred direction is smaller. It follows that, given any two proposals, $\mathbf{x}_1$, $\mathbf{x}_2$, an individual will vote for $\mathbf{x}_1$ in preference to $\mathbf{x}_2$ iff $\mathbf{x}_p(\mathbf{x}_1 - \mathbf{x}_2) > 0$.

Let $g(\mathbf{x})$ denote the density function of individuals' most preferred directions, where $g(\mathbf{x})$ is continuous and bounded and is defined so as to satisfy the multiple Riemann integral equation

$$\int_{Q_1} g(\mathbf{x})\,\mathrm{d}\mathbf{x} = 1, \tag{A1}$$

where Q_1 is the interval in $\mathbf{R}^n$ defined by

$$Q_1 = \{\mathbf{x};\quad |\mathbf{x}| = 1\}.$$

For $\mathbf{x} \in \mathbf{R}^2$, Q_1 is the unit circle, in $\mathbf{R}^3$, a unit sphere, etc. Henceforward, all vectors $\mathbf{x}$, $\mathbf{y}$, $\mathbf{z}$, etc., are assumed to be unit vectors and specifications of the type $|\mathbf{x}| = 1$ are omitted. A majority will prefer a direction $\mathbf{x}_0$ to the *status quo* if

$$\int_{Q_2} g(\mathbf{x})\,\mathrm{d}\mathbf{x} > 0.5, \tag{A2}$$

where

$$Q_2 = \{\mathbf{x};\quad \mathbf{x} \cdot \mathbf{x}_0 \geqslant 0\}.$$

Now, consider two proposals $\mathbf{x}_1$, $\mathbf{x}_2$. Proposal $\mathbf{x}_1$ will be preferred by majority vote to proposal $\mathbf{x}_2$ if

$$\int_{Q_3} g(\mathbf{x})\,\mathrm{d}\mathbf{x} > 0.5, \tag{A3}$$

where

$$Q_3 = \{\mathbf{x};\quad \mathbf{x}(\mathbf{x}_1 - \mathbf{x}_2) \geqslant 0\}.$$

An undominated direction may now be defined.

Definition 1′: A direction $\mathbf{x}_0$ will be undominated if

$$\int_{Q_4(\mathbf{x}_1, \mathbf{x}_u)} g(\mathbf{x})\,\mathrm{d}\mathbf{x} > 0.5$$

where

$$Q_4(\mathbf{x}_1, \mathbf{x}_u) = \{\mathbf{x};\quad \mathbf{x}(\mathbf{x}_0 - \mathbf{x}_1) \geqslant 0\}$$

holds for all $\mathbf{x}_1$ such that $\mathbf{x}_1 = \mathbf{x}_0$.

Uniqueness of the Undominated Direction

If an undominated direction exists, it is unique. This is straightforward to establish as follows. Note from (A1) that

$$\int_{Q_4(\mathbf{x}_1, \mathbf{x}_2)} g(\mathbf{x})\,\mathrm{d}\mathbf{x} + \int_{Q_4(\mathbf{x}_2, \mathbf{x}_1)} g(\mathbf{x})\,\mathrm{d}\mathbf{x} = 1. \tag{A4}$$

Now, suppose that $\mathbf{x}_u$ is undominated. Then

$$\int_{Q_4(\mathbf{x}_1,\mathbf{x}_u)} g(\mathbf{x})\,d\mathbf{x} > 0.5$$

for all $\mathbf{x}_1 \neq \mathbf{x}_u$. Now, suppose that $\mathbf{x}_a$, $\mathbf{x}_a \neq \mathbf{x}_u$ is another undominated direction. Then

$$\int_{Q_4(\mathbf{x}_1,\mathbf{x}_a)} g(\mathbf{x})\,d\mathbf{x} > 0.5$$

for all $\mathbf{x}_1 \neq \mathbf{x}_a$. This implies

$$\int_{Q_4(\mathbf{x}_a,\mathbf{x}_1)} g(\mathbf{x})\,d\mathbf{x} < 0.5$$

for all $\mathbf{x}_1 \neq \mathbf{x}_a$. But the latter condition must include $\mathbf{x}_1 = \mathbf{x}_u$, so

$$\int_{Q_4(\mathbf{x}_a,\mathbf{x}_u)} g(\mathbf{x})\,d\mathbf{x} > 0.5,$$

which contradicts $\mathbf{x}_u$ being an undominated direction.

Sufficient Conditions for an Undominated Direction

The following sufficiency theorem can be fairly easily established.

Theorem: If g is single peaked at $\mathbf{x}_u$ and radially monotonically decreasing around $\mathbf{x}_u$ such that

$$g(\mathbf{x}_1) \gtreqless g(\mathbf{x}_2) \quad \text{as} \quad \mathbf{x}_1\cdot\mathbf{x}_u \gtreqless \mathbf{x}_2\cdot\mathbf{x}_u,$$

then $\mathbf{x}_u$ is an undominated direction.

Define

$$Q(\mathbf{z}) = \{\mathbf{x};\quad |\mathbf{x}| = 1, \mathbf{x}\cdot\mathbf{z} \geqslant 0\}.$$

The function g is symmetric around the direction $\mathbf{x}_u$. This means that, for any $\mathbf{z}$ satisfying $\mathbf{z}\cdot\mathbf{x}_u = 0$,

$$\int_{Q(\mathbf{z})} g(\mathbf{x})\,d\mathbf{x} = \int_{Q(-\mathbf{z})} g(\mathbf{x})\,d\mathbf{x} = 0.5. \qquad \text{(A5)}$$

Define $\mathbf{y} \equiv \mathbf{x}_u - \mathbf{x}_1$ ($\neq 0$ since $\mathbf{x}_1 \neq \mathbf{x}_u$). Then $\mathbf{y}\cdot\mathbf{x}_u = 1 - \mathbf{x}_1\cdot\mathbf{x}_u > 0$. Referring to Definition 1′, we need to show that

$$\int_{Q(\mathbf{y})} g(\mathbf{x})\,d\mathbf{x} > 0.5 \qquad \text{(A6)}$$

holds for any $\mathbf{y}$ satisfying $\mathbf{y}\cdot\mathbf{x}_u > 0$. This can be done by comparing the sets $Q(\mathbf{y})$, $Q(\mathbf{z})$. These sets may be related by considering $Q(\mathbf{y})$ to have gained an interval Q_g, and lost an interval, Q_l, relative to $Q(\mathbf{z})$, such that

$$Q(\mathbf{y}) = Q(\mathbf{z}) + Q_g - Q_l, \qquad \text{(A7)}$$

where

$$Q_g = \{\mathbf{x};\quad |\mathbf{x}| = 1, \mathbf{x}\cdot\mathbf{z} < 0, \mathbf{x}\cdot\mathbf{y} \geqslant 0\}, \qquad \text{(A8)}$$

$$Q_l = \{\mathbf{x};\quad |\mathbf{x}| = 1, \mathbf{x}\cdot\mathbf{z} \geqslant 0, \mathbf{x}\cdot\mathbf{y} < 0\}. \qquad \text{(A9)}$$

Note that Q_g, Q_l are radially symmetric in the sense that, if $\mathbf{x} \in \operatorname{int} Q_g$, then $-\mathbf{x} \in Q_l$ etc.

Any vector $\mathbf{y}$ satisfying $\mathbf{y}\cdot\mathbf{x}_u > 0$ can be expressed as a linear combination of $\mathbf{x}_u$ with some particular orthogonal vector $\mathbf{z}$ such that

$$\mathbf{y} = \alpha\mathbf{x}_u + \beta\mathbf{z}, \quad \alpha, \beta > 0. \qquad \text{(A10)}$$

Thus, we may write

$$Q_g = \{\mathbf{x};\ |\mathbf{x}| = 1, \mathbf{x}\cdot\mathbf{z} < 0, \mathbf{x}(\alpha\mathbf{x}_u + \beta\mathbf{z}) \geqslant 0\}. \qquad \text{(A11)}$$

From (A11), since $\mathbf{x}\cdot\mathbf{z} < 0$ and $\alpha, \beta > 0$, if $\mathbf{x} \in Q_g$, then $\mathbf{x}\cdot\mathbf{x}_u > 0$. Thus, if $\mathbf{x} \in \operatorname{int} Q_g$, then

(i) $\mathbf{x}\cdot\mathbf{x}_u > 0$,

(ii) $-\mathbf{x}\cdot\mathbf{x}_u < 0$,

(iii) $-\mathbf{x} \in Q_l$,

(iv) $g(\mathbf{x}) > g(-\mathbf{x})$.

Property (iv) follows from (i) and (ii) and the assumption about g in the theorem, since $\mathbf{x}\cdot\mathbf{x}_u > -\mathbf{x}\cdot\mathbf{x}_u$. Properties (i)–(iv) imply that

$$\int_{Q_g} g(\mathbf{x})\,d\mathbf{x} > \int_{Q_l} g(\mathbf{x})\,d\mathbf{x}. \qquad \text{(A12)}$$

Now, from (A7),

$$\int_{Q(\mathbf{y})} g(\mathbf{x})\,d\mathbf{x} = \int_{Q(\mathbf{z})} g(\mathbf{x})\,d\mathbf{x} + \int_{Q_g} g(\mathbf{x})\,d\mathbf{x} - \int_{Q_l} g(\mathbf{x})\,d\mathbf{x}. \qquad \text{(A13)}$$

Equations (A5), (A12), and (A13) imply that (A6) holds for any $\mathbf{y}$ satisfying $\mathbf{y}\cdot\mathbf{x}_u > 0$. Hence $\mathbf{x}_u$ is an undominated direction.

Accounting and Business Research, Vol. 20, No. 78, pp. 111–121, 1990

The Meaning of Audit Reports

Graham Holt and Peter Moizer*

Abstract—This paper reports the results of a study of how the various stylised forms of audit report used in the UK are interpreted by both accountants and professional users of audited financial statements. The results indicate that both accountants and users distinguish between the various audit reports, although users found less difference than accountants. The greatest divergences of interpretation concerned the qualification relating to lack of internal control (small companies qualification) and the going concern qualification.

The main purpose of this paper is to report the results of a study into how the various stylised forms of audit report used in the UK are interpreted by both accountants and users of audited financial statements. The principal measuring device used was a form of semantic differential testing instrument.

Review of earlier studies

More detailed reviews of some of the earlier studies to be mentioned in this section can be found in Craswell (1985) and Gwilliam (1987). In this section, we classify qualified audit studies into two types: (1) reaction studies, which examine the whole communication process from the issuing of the audit report to the result of users reacting to it; and (2) interpretation studies, which concentrate on the first link in the communication process where users interpret the auditor's message. Reaction studies can themselves be further subdivided into two types: studies which examine the decisions of individuals in laboratory type experiments and studies which examine market model residuals after a qualified audit report has been issued. The results of these three types of studies are summarised below.

The findings of the laboratory type studies are not clear cut. Estes and Reimer (1977 and 1979) found that bankers' loan decisions were unaffected by the existence of a qualified audit report but that financial analysts' investment appraisal decisions were affected. Estes (1982) examined investors' attitudes to investment in a company and found that 'with the exception of the adverse opinion, audit reports have, at best, a very limited effect on investors'. Libby (1979a) tested bankers' loan decisions and found that the audit report had no discernible effect on the loan decision. Houghton (1983) also found that bankers seemed to regard audit reports as being unimportant when deciding whether to grant a loan to a company. However, Firth (1979 and 1980) found that the maximum loan a banker would give was significantly affected by the existence of going concern and asset valuation audit qualifications, but not by qualifications concerning the lack of compliance with generally accepted accounting standards. Gul (1987) found that bank lending officers' perceptions of risk increased when a 'subject to' opinion was present.

The results of the market model reaction studies are also unclear. Baskin (1972) and Alderman (1977) found little difference in market residuals of companies with uncertainty type qualifications. Ball *et al.* (1979) found no evidence to enable them to conclude that qualifications had a significantly adverse effect on share prices. Firth (1978) produced ambiguous results showing that firms with significant audit qualifications had significant price changes, but these could have been caused by the provision of more detailed financial information when the qualified audit report was issued. Davis (1982) found that the 'subject to' audit opinion in itself had no information content, having been pre-empted by other sources of information prior to the release of the audit report. Chow and Rice (1982) produced results showing that audit qualifications were associated with downward changes in share prices. Elliott (1982) found that 'subject to' opinions were issued in conjunction with several types of uncertainty having differing economic significance and that, where the economic event had significance, the market obtained this information well in advance of the qualification itself. This result supports the notion that the information content of the opinion is relatively low. Dodd *et al.* (1984) investigated the possibility that qualifications could result in a revision of user expectations and hence have information content. However, the authors discovered that 'subject to' opinions had only little impact on share prices. Apart from the methodological problems associated with market model studies (Foster, 1980), a further complication was discovered by Banks and Kinney (1982) who showed that publicity associated with the circumstances of the audit qualification was linked to unfavourable price reactions. It would appear that the price reaction to a qualified report is a function of the media coverage given to the qualification. This result is supported by Dopuch *et al.* (1986) who found evidence of a significant negative share price reaction to media disclosures of 'subject to' qualified audit opinions.

---

*The authors are, respectively, principal lecturer in accounting at Manchester Polytechnic and professor of accounting at the University of Leeds. They are grateful to Peat Marwick McLintock for financial support. Any views expressed however are those of the authors alone.

The above results tend to suggest that audit qualifications have some significance for users. However, as always, it is important to consider the methodological problems. For example, a frequent criticism of laboratory type studies is that they abstract too much from the real world and hence that subjects are making artificial judgements in an artificial situation. In the market model tests, the degree of noise surrounding share price movements is such that, unless the price effect is very large, the share price impact of audit qualifications may well be lost in general background effects. The nature of the reaction studies is therefore that a positive result implies that the numerous joint hypotheses *can* be rejected, but that a null result only implies that one part of the joint hypotheses *cannot* be rejected (i.e. the lack of significance of audit qualifications is only one of many explanations for the null result).

In contrast to the reaction studies which investigate the effects of audit reports, interpretation studies take for granted that audit reports are important and concentrate instead on the reports' meaning. Several such studies have been carried out, but, because of the differing experimental tests used, none of them can be directly compared. Adelberg (1979) studied the use of standardised messages in the audit report and concluded that such messages were incomprehensible. Libby (1979b) compared bankers' and auditors' perceptions of the messages communicated in ten different kinds of audit reports. He found no large differences and concluded that little misunderstanding occurred. Bailey (1981) found that financial analysts made little distinction among several different types of audit reports, with the exception of the auditor's adverse opinion, which they perceived in a much more favourable light than the others. One explanation for this apparently strange result is that analysts give greater credibility to auditors when they issue adverse qualifications. Bailey *et al.* (1983) found that changing the wording of audit reports did produce an absolute but not a relative difference in perceptions between two sets of alternatively worded reports. They also compared the perceptions of newly qualified CPAs with those of fourth-year accounting students who had not been taught auditing and concluded that, in terms of the perceived relative relationships within a set of audit reports, readers with different audit report knowledge levels did not perceive significantly different messages. Houghton (1987) used a semantic differential instrument to compare the perceptions of Australian shareholders and accountants of the phrase 'true and fair view'. He found significant differences between the two groups. Robertson (1988) examined the attitudes of financial analysts to seven types of audit report using three scales: credibility added, reliance and satisfaction. His results showed that analysts did not make any significant distinctions among the 'except for', 'modified except for' and unqualified opinions. Analysts also 'properly perceived' (p. 88) the disclaimer based on uncertainty and the management report as significantly different from the other reports.

Experimental method

The first part of the research project involved holding unstructured interviews with UK auditors and users of financial statements. The sample consisted of three audit partners, two audit managers, one stockbroker, two investment fund managers, two bank managers, two managing directors of small companies, three financial accounting lecturers and five financial accounting undergraduate students. The interviewees were requested to examine thirteen different examples of audit report based on the wording recommended by the Audit Practices Committee. The examples of audit report wording were presented one at a time and the interviewees asked to state what the phraseology meant to them. A conscious attempt was made not to lead the respondents during the interviews, nor to express any opinions on statements made by them. Occasionally, when prompting became necessary, it was used only to develop an area for further discussion.

The results of the interviews were summarised and then distilled into the basic concepts underlying their reactions to audit reports. The distillation process was aided by consulting the Statement of Financial Concepts No. 2 'Qualitative Characteristics of Accounting Information' issued by the FASB. Whilst this statement is primarily concerned with the goals and purposes of financial reporting, many of its concepts have close parallels in the replies of the interviewees. In order to assess the meaning that individuals attribute to words, the semantic differential method pioneered by Osgood *et al.* (1957) was used. This approach treats meaning as multi-dimensional, with each dimension represented by a bipolar adjective scale (e.g. hot and cold, good and bad etc.). Subjects are asked to assess what a particular word or phrase means to them on each of the scales, and from these responses a multi-dimensional map can be created. It was originally intended to create a semantic differential using bipolar adjectival scales (e.g. using adjective pairs such as good-bad, reliable-unreliable etc: see Oliver, 1974), but it soon became apparent that some of the underlying concepts required phrases to describe them. In these cases it was impossible to create appropriate antonyms and so it was decided to use a Likert scale to measure subjects' agreement or disagreement with the phrases used. Research in the marketing literature has shown that the bipolar adjectival and Likert scale approaches produce consistent results and so no loss of power should occur because of the use of a Likert scale. Accordingly, a semantic differential was produced consisting of thirteen key concepts and a seven point Likert scale (where 1 = strongly agree, 2 = generally agree, 3 = slightly agree, 4 = neutral, 5 = slightly disagree, 6 = generally disagree, 7 = strongly disagree). An eighth column headed 'don't know' was added to distinguish the replies of individuals who had no idea of a particular concept from those who had but whose view was 'neutral'.

A questionnaire was then compiled consisting of eight examples of audit report wording, each placed on top of the semantic differential. The number of audit report examples was reduced from the thirteen used in the interviews, to make the questionnaire of an acceptable length. The basis for selection was the relative frequency of use and the importance of the qualification. It was not easy to gauge the extent of use, but an analysis of the qualifications listed in *The Audit Report* (shown in Table 1) gives some indication, although unfortunately the classification scheme masks some of the types of qualification used.

The report formats used are given in Exhibit 1. It will be noticed that a similar set of circumstances were used for the four qualifications: 'subject to', 'except for', 'disclaimer' and 'adverse'. The reason for keeping the same heading was to control for the effects of the circumstances surrounding the qualification. If a different set of circumstances had been used, it would not have been possible to determine which differences were due to the form of the audit report wording and which differences were due to the differing circumstances surrounding the qualification. Whilst this approach ensures greater experimental control, there is inevitably some loss of realism because in the real world the reader would expect some quantification of the divergence of opinion between the auditor and the directors of the company.

The questionnaire was pilot tested and a revised questionnaire sent out to firms listed in *Crawfords Directory of City Connections 1986.* The questionnaires were sent to the senior partner at the office of the audit firm and to named individuals in the other 'user' organisations. Table 2 summarises the number of questionnaires sent out and the usable response rates. Individuals working for firms of auditors were classed as 'accountants' and individuals who worked in stockbrokers, insurance companies, investment trusts etc., pension funds and banks were classed as 'users'.

Table 1

Analysis of Audit Reports Issued in the UK*

		12 months to March		
Types of Qualification	*1989*	*1988*	*1987*	*1986*
Internal control (small companies)	22.2	19.6	20.0	18.4
Depreciation	1.9	2.0	2.5	3.2
Going concern	4.5	4.1	4.6	4.3
Uncertainty	1.0	0.7	1.0	1.4
Stock	1.2	1.7	1.6	1.6
Inadequate information	0.6	0.4	0.4	0.4
Deferred tax	0.5	0.6	0.4	0.6
Other	1.4	1.3	1.7	1.5
Total qualifications	33.3	30.4	32.2	31.4
Unqualified reports	66.7	69.6	67.8	68.6
	100.0	100.0	100.0	100.0

*Derived from tables produced in *The Audit Report* which were based upon an analysis of a large number of audit reports (between 12,000 and 24,000 depending on the year).

Exhibit 1

Summary of Reports and Phrases Tested in the Questionnaire

Standard Unqualified Audit Report

We have audited the financial statements in accordance with approved auditing standards. In our opinion the financial statements, which have been prepared under the historical cost convention, give a true and fair view of the state of the company's affairs at 31st October 1986 and of its profit and source and application of funds for the year then ended and comply with the Companies Act 1985.

'Subject to' Audit Opinion

We have audited the financial statements in accordance with approved auditing standards. The estimates of losses to completion of long-term construction contracts depend on a number of assumptions including those related to substantially increased production and productivity which has yet to be achieved. In view of these uncertainties, the company has not provided for losses on these contracts.

Subject to the above matter, in our opinion the financial statements, which have been prepared under the historical cost convention, give a true and fair view of the state of the company's affairs at 31st October 1986 and of its profit and source and application of funds for the year then ended and comply with the Companies Act 1985.

'Except for' Audit Opinion

This report contained the same explanatory paragraph as the 'subject to' report with the only difference being the substitution for the words 'subject to the above matter' with the words 'except for the above matter':

> Except for the above matter, in our opinion the financial statements, which have been prepared under the historical cost convention, give a true and fair view of the state of the company's affairs at 31st October 1986 and of its profit and source and application of funds for the year then ended and comply with the Companies Act 1985.

'Disclaimer' Opinion

This report contained the same explanatory paragraph as the 'subject to' and 'except for' opinions, the only difference being the opinion paragraph set out below:

> Because of the significance of the above matter, we are unable to form an opinion as to whether the financial statements give a true and fair view of the state of the company's affairs as at 31st October 1986 and of its profit for the year then ended or whether the financial statements comply in all respects with the Companies Act 1985.

'Adverse' Opinion

This report contained the same explanatory paragraph as the previous three qualification types, except that the opinion paragraph was as set out below:

> Because of the significance of the above matter, in our opinion the financial statements do not give a true and fair view of the statement of affairs of the company at 31 October 1986 and of its profit and source and application of funds for the year then ended. In other respects the financial statements in our opinion comply with the Companies Act 1985.

'Limitation of Scope' Audit Report

The following audit report was used in the questionnaire:

> We were unable to carry out all the auditing procedures or to obtain all the information and explanations we considered necessary.
>
> Because of the significance of the above matter, we are unable to form an opinion as to whether the financial statements give a true and fair view of the state of the company's affairs as at 31 October 1986 and of its profit for the year then ended or whether the financial statements comply in all respects with the Companies Act 1985.

continued

Exhibit 1—*continued*

'Small Companies' Report

A full audit report was not used in the questionnaire, simply the following explanatory paragraph:

> In common with many businesses of similar size and organisation the company's system of control is dependent upon the close involvement of the directors. Where independent confirmation of the completeness of the accounting records was therefore not available, we have accepted assurances from the directors that all the company's transactions have been reflected in the records.

'Going Concern' Report

The following explanatory paragraph was used in the questionnaire without the opinion paragraph:

> The accounts have been prepared on a going concern basis which in our opinion is contingent upon the continued support of the bankers and creditors.

The overall usable response rate was 36.5% and in order to check for non-response bias a chi-squared test was performed on pre- and post-second request letters. As only 6 out of the 104 questions showed a significant difference at the 5% level, it was concluded that there was no evidence to suggest non-response bias. Unfortunately, because the sample size was not large enough, only one form of the questionnaire was used and so it is not possible to test the extent to which the order of the scales produced some kind of 'halo' effect. The thirteen scales were arranged in terms of their similarity and so some ordering effects may be present, but because the substance of the study is a comparison of accountants and users and a comparison of the effects of the various report forms, it is not unreasonable to presume that any order effects are likely to be common to both samples.

Results of the questionnaire study

The results of the questionnaire survey contain two basic elements: the extent to which accountants and users distinguish between the various audit report types, and the extent to which accountants and users agree over the meaning of various audit reports. It will be remembered that the qualifications did not include any form of quantification of the extent of the disagreement between the auditor and the directors of the company. Hence, although in practice the reader of the financial statements could see for him or herself how significant the difference was, in the present study respondents were unable to do this. The effect of this lack of information may be to make the audit report more important than it would be in reality and this tendency should be borne in mind when interpreting the results.

Table 2
Response Rates

	Sampled	*Usable Responses*	*Usable Response Rate* %
Audit firms	423	193	45.6
Stockbrokers	99	25	25.3
Insurance companies	62	27	43.5
Investment trusts, charities, unit trusts, investment advisers	140	23	16.4
Self-investing pension funds	70	19	27.1
Banks	134	52	38.8
	928	339	36.5

Table 3

The Perceptions of Accountants

		Audit Report Type							
		A *Unqualified*	*B* *Subject to*	*C* *Except for*	*D* *Disclaimer*	*E* *Adverse*	*F* *Limitation of scope*	*G* *Small companies*	*H* *Going concern*
A.	The financial statements								
1.	can be relied upon	1.8 (1)	4.7 (4=)	4.8 (4=)	6.0 (6)	6.4 (7=)	6.5 (7=)	3.2 (2=)	3.1 (2=)
2.	are useful	2.4 (1)	4.0 (4)	4.3 (5)	5.1 (6)	5.7 (7)	6.1 (8)	3.1 (2=)	2.9 (2=)
3.	comply with company law	1.4 (1)	3.1 (4)	3.5 (5)	3.8 (6)	4.6 (7)	5.7 (8)	2.6 (3)	2.2 (2)
4.	comply with accepted accounting practice	1.6 (1)	4.8 (4=)	4.9 (4=)	5.1 (5)	5.8 (7)	5.5 (6)	2.6 (3)	2.4 (2)
5.	contain no deliberate distortions	2.0 (1)	3.9 (4)	4.2 (5)	4.4 (6)	5.3 (7=)	5.1 (7=)	3.0 (3)	2.6 (2)
6.	contain no accidental errors	3.4 (1=)	3.6 (3=)	3.7 (3=)	3.7 (3=)	3.9 (7)	4.9 (8)	3.7 (3=)	3.3 (1=)
7.	have no significant omissions	2.0 (1)	4.4 (4=)	4.5 (4=)	5.0 (6=)	5.6 (8)	5.2 (6=)	3.3 (3)	2.7(2)
B.	The auditor								
1.	has conducted a full audit	1.8 (1)	2.4 (2=)	2.4 (2=)	2.5 (2=)	2.4 (2=)	6.2 (8)	3.8 (7)	2.2 (2=)
2.	accepts full legal responsibility	3.7 (1)	4.4 (2=)	4.7 (4=)	5.2 (6)	5.4 (7)	6.3 (8)	4.8 (4=)	4.2 (2=)
3.	agrees with the directors on accounting principles	2.2 (1)	4.1 (4)	4.9 (5=)	5.1 (5=)	6.0 (8)	5.2 (5=)	2.8 (2=)	2.7 (2=)
C.	Appropriate management controls exist	3.3 (1=)	3.8 (3=)	4.0 (3=)	4.2 (5=)	4.2 (5=)	5.5 (8=)	4.6 (7)	3.2 (1=)
D.	The future viability of the company is assured	4.2 (1=)	5.0 (3=)	5.1 (3=)	5.5(6=)	5.5 (6=)	4.9 (3=)	4.1 (1=)	5.7 (6=)
E.	The directors have properly discharged their legal duties	3.4 (1=)	4.4 (4)	4.7 (5)	5.0 (6)	5.4 (7)	6.0 (8)	3.7 (3)	3.4 (1=)

Key The above means for accountants are calculated using the scale: 1 = Strongly agree, 2 = Generally agree, 3 = Slightly agree, 4 = Neutral, 5 = Slightly disagree, 6 = Generally disagree, 7 = Strongly disagree. The rankings were obtained using the Wilcoxon Matched-Pairs Signed-Ranks Test. An equals sign indicates that the responses are not significantly different at a 5% level.

Table 4
The Perceptions of Users

		Audit Report Type							
		A *Unqualified*	*B* *Subject to*	*C* *Except for*	*D* *Disclaimer*	*E* *Adverse*	*F* *Limitation of scope*	*G* *Small companies*	*H* *Going concern*
A.	The financial statements								
1.	can be relied upon	2.3 (1)	4.4 (2=)	4.6 (2=)	5.5 (6)	5.8 (7)	6.5 (8)	4.7 (2=)	4.5 (2=)
2.	are useful	2.3 (1)	3.8 (2=)	4.0 (2=)	4.8 (6)	5.1 (7)	5.8 (8)	4.1 (2=)	3.9 (2=)
3.	comply with company law	1.7 (1)	2.5 (2)	3.0 (3=)	3.3 (3=)	3.8 (5=)	5.3 (8)	3.9 (5=)	3.6 (5=)
4.	comply with accepted accounting practice	1.9 (1)	3.5 (2=)	3.6 (2=)	4.1 (2=)	4.5 (7)	5.7 (8)	4.0 (2=)	3.7(2=)
5.	contain no deliberate distortions	2.6 (1)	3.8 (2=)	3.9 (2=)	4.2 (2=)	4.6 (2=)	5.1 (8)	4.1 (2=)	3.8 (2=)
6.	contain no accidental errors	3.7 (1)	4.0 (2=)	4.1 (2=)	4.2 (2=)	4.3 (2=)	5.0 (8)	4.6 (7)	4.2 (2=)
7.	have no significant omissions	3.1 (1)	4.6 (2=)	4.7 (2=)	5.1 (2=)	5.3 (7)	5.7 (8)	4.5 (2=)	4.2 (2=)
B.	The auditor								
1.	has conducted a full audit	2.5 (1)	3.0 (2=)	3.2 (2=)	3.3 (2=)	3.2 (2=)	5.9 (8)	5.2 (7)	3.5 (2=)
2.	accepts full legal responsibility	3.7 (1)	4.3 (2=)	4.4 (2=)	4.8 (4=)	4.8 (4=)	6.0 (8)	5.3 (7)	4.8 (4=)
3.	agrees with the directors on accounting principles	3.0 (1)	4.6 (2=)	4.8 (2=)	5.4 (6)	5.7 (7=)	5.9 (7=)	4.4 (2=)	4.1 (2=)
C.	Appropriate management controls exist	3.6 (1)	4.4 (2=)	4.6 (2=)	5.0 (5=)	5.1 (5=)	6.0 (8)	5.0 (5=)	4.6 (2=)
D.	The future viability of the company is assured	4.9 (1)	5.7 (4)	5.5 (3)	6.1 (5=)	6.0 (5=)	6.0 (5=)	5.2 (2)	6.2 (5=)
E.	The dirtectors have properly discharged their legal duties	3.3 (1)	4.0 (2=)	4.1 (2=)	4.5 (5=)	4.9 (7)	5.9 (8)	4.4 (5=)	4.1 (2=)

Key The above means for users are calculated using the scale: 1 = Strongly agree, 2 = Generally agree, 3 = Slightly agree, 4 = Neutral, 5 = Slightly disagree, 6 = Generally disagree, 7 = Strongly disagree. The rankings were obtained using the Wilcoxon Matched-Pairs Signed-Ranks Test. An equals sign indicates that the responses are not significantly different at a 5% level.

Comparison of the Interpretation of the Different Audit Reports

In Tables 3 and 4, the reactions respectively of accountants and users to the various audit report types are summarised. The Wilcoxon Matched-Pairs Signed-Ranks Test was used to test whether there was any significant difference (at the 5% level) between the replies of respondents on the thirteen dimensions. An examination of Table 3 shows that accountants did distinguish between all the various audit report types on at least one dimension (whether the financial statements complied with company law) and that no pair of audit report types had less than six out of thirteen differences significant at the 5% level. These results suggest that accountants do perceive significantly different nuances in the eight audit report forms tested.

In contrast, as Table 4 shows, the users found less distinguishability in the various audit report types. When the 'subject to' and 'except for' results are examined, it can be seen that the users significantly differentiated between the reports on only two dimensions: whether the financial statements comply with company law and whether the future viability of the company is assured. Apart from these two qualifications, users distinguished between the other audit report types with always at least seven significant differences between any pair of audit reports.

Apart from enabling one to determine whether individual respondents distinguished between audit report types, the results can also be used to show which semantic scales are most useful in distinguishing between audit report types and hence which ones best indicate the changes of meaning attributed to a reading of the financial statements when different audit reports are attached. Table 5 indicates the number of different ranks produced by each of the thirteen semantic scales. As previously mentioned the scale based on whether the financial statements comply with company law is the most effective distinguishing scale for accountants showing significant differences for all audit report types tested. However, no scale failed to produce any significant differences and hence all scales have some usefulness.

Comparison of Accountant and User Perceptions

The responses of accountants and users are directly compared in Table 6 which shows that out of the 104 comparisons, 78 showed a difference at a 10% significance level and of those, 72 showed a difference at the 5% significance level. It is therefore possible to reject the null hypothesis that accountants and users have the same perceptions of the meaning of the audit report wordings tested.

Table 6 also shows many revealing insights into the differing perceptions of accountants and users. Examination of the unqualified audit report results column shows that, compared to accountants, users generally feel that financial statements are less reliable, less likely to comply with company law and accepted accounting practice and less likely to be distortion free with no accidental errors or significant omissions. Other differences were that, compared to accountants, users have less confidence in the completeness of the audit work carried out by the auditor, and they also have less confidence that an unqualified audit report signifies agreement between the auditor and directors on accounting principles. Compared to the accountants, the users are also more sceptical about whether appropriate management controls exist and whether the future viability of the company is assured.

The unqualified audit report had significant differences between users and accountants all in the same direction (i.e. users were more sceptical than accountants). By contrast, the direction of the differences is much more varied when qualified

Table 5
Usefulness of Semantic Scales

	Number of Different Ranks	
	Accountants	*Users*
Reliability of the FS	5	5
Usefulness of the FS	7	5
Compliance of the FS with company law	8	5
Compliance of the FS with accepted accounting practice	7	4
Whether the FS contain any deliberate distortions	7	3
Whether the FS have any significant omissions	6	4
Whether the auditor has conducted a full audit	4	4
Whether the auditor accepts full legal responsibility	6	5
Whether the auditor agrees with the directors on accounting principles	5	4
Whether appropriate management controls exist	5	4
Whether the future viability of the company is assured	3	5
Whether the directors have properly discharged their legal duties	7	5

Table 6

Accountants' and Users' Perceptions Compared

	Audit Report Type																							
	A *Unqualified*			*B* *Subject to*			*C* *Except for*			*D* *Disclaimer*			*E* *Adverse*			*F* *Limitation of scope*			*G* *Small companies*			*H* *Going concern*		
	A	U	MW	A	U	MW	A	U	MW	A	U	MW	A	U	MW	A	U	MW	A	U	MW	A	U	MW
A. The financial statements																								
1. can be relied upon	1.8	2.3	**	4.7	4.4	**	4.8	4.6	NS	6.0	5.5	**	6.4	5.8	**	6.5	6.5	NS	3.2	4.7	**	3.1	4.5	**
2. are useful	2.4	2.3	NS	4.1	3.8	NS	4.2	4.0	NS	5.1	4.8	NS	5.7	5.1	**	6.1	5.8	NS	3.1	4.1	**	2.9	3.9	**
3. comply with company law	1.4	1.7	**	3.1	2.5	**	3.5	3.0	*	3.9	3.3	*	4.6	3.8	**	5.7	5.3	*	2.6	3.9	**	2.2	3.6	**
4. comply with accepted accounting practice	1.6	1.9	**	4.8	3.5	**	4.9	3.6	**	5.1	4.1	**	5.8	4.5	**	5.5	5.7	NS	2.6	4.0	**	2.4	3.7	**
5. contain no deliberate distortions	2.0	2.6	**	3.9	3.8	NS	4.2	3.9	NS	4.4	4.2	NS	5.3	4.6	**	5.1	5.1	NS	3.0	4.1	**	2.6	3.8	**
6. contain no accidental errors	3.4	3.7	*	3.6	4.0	*	3.7	4.1	**	3.7	4.2	**	3.9	4.3	**	4.9	5.0	NS	3.7	4.6	**	3.3	4.2	**
7. have no significant omissions	2.0	3.1	**	4.4	4.6	NS	4.5	4.7	NS	5.0	5.1	NS	5.6	5.3	**	5.2	5.7	NS	3.3	4.5	**	2.7	4.2	**
B. The auditor																								
1. has conducted a full audit	1.8	2.5	**	2.4	3.0	**	2.4	3.2	**	2.5	3.3	**	2.4	3.2	**	6.2	5.9	NS	3.8	5.2	**	2.2	3.5	**
2. accepts full legal responsibility	3.7	3.7	NS	4.4	4.3	NS	4.7	4.4	NS	5.2	4.8	**	5.4	4.8	**	6.3	6.0	NS	4.8	5.3	**	4.2	4.8	**
3. agrees with the directors on accounting principles	2.2	3.0	**	4.1	4.6	**	4.9	4.8	NS	5.1	5.4	NS	6.0	5.7	**	5.2	5.9	**	2.8	4.4	**	2.7	4.1	**
C. Appropriate management controls exist	3.3	3.6	**	3.8	4.4	**	4.0	4.6	**	4.2	5.0	**	4.2	5.1	**	5.5	6.0	*	4.6	5.0	**	3.2	4.6	**
D. The future viability of the company is assured	4.2	4.9	**	5.0	5.7	**	5.1	5.5	**	5.5	6.1	**	5.5	6.0	**	4.9	6.0	**	4.1	5.2	**	5.7	6.2	**
E. The directors have properly discharged their legal duties	3.4	3.3	NS	4.4	4.0	**	4.7	4.1	**	5.0	4.5	**	5.4	4.9	**	6.0	5.9	NS	3.7	4.4	**	3.4	4.1	**

Key A and U refer to the means for accountants and users respectively using the scale: 1 = Strongly agree, 2 = Generally agree, 3 = Slightly agree, 4 = Neutral, 5 = Slightly disagree, 6 = Generally disagree, 7 = Strongly disagree. MW refers to the Mann-Whitney level of significance: ** = at 5%, * = at 10%, NS = not significant at the 10% level.

audit reports are examined. The differences will be summarised for each audit qualification type (readers are referred to Table 6 for more information).

'*Subject to*': Compared to accountants, users had *more* confidence in the reliability of financial statements and that they complied with company law and accepted accounting practice. They also had more confidence that the directors had properly discharged their legal duties. These four results are at variance with the unqualified results noted earlier. The remaining five differences were in the same direction as the unqualified audit report.

'*Except for*': The results of this type of qualification mirror those of the subject to.

'*Disclaimer*': This audit report also has more effect on accountants than users. Accountants had less confidence than users in four areas: the reliability of financial statements; whether the financial statements comply with company law and accepted accounting practice and whether the auditor accepts full legal responsibility. Again these results are against the trend noted for the unqualified audit report. The remaining five differences were in the same direction as the unqualified audit report.

'*Adverse*': This audit report produced the greatest number of differences between accountants and users. In this case, accountants had less confidence than users in nine areas: the reliability of financial statements, their usefulness, their compliance with company law and accepted accounting practice, their lack of deliberate distortions and their lack of significant omissions, together with whether the auditor has conducted a full audit and agrees with the directors on accounting principles, and finally whether the directors have properly discharged their legal duties. In the remaining four areas, the results were in the same direction as the unqualified report.

'*Limitation of Scope*': This question produced only four significant differences, all of which were in the direction of users being more sceptical.

'*Small Companies*' *and* '*Going Concern*': Both these qualification types made the users feel distinctly less confident in the financial statements than the accountants on all thirteen dimensions. These results imply that accountants may not be aware of the increased uncertainty caused by the use of these two qualification types.

Conclusion

The results of the research indicate that both accountants and users distinguished between the various audit reports, although users found fewer differences than accountants. Substantial areas of disagreement appear to exist between accountants and the users of audited financial statements. The disagreement concerns both the meaning of the unqualified audit report and the interpretation to be placed on the qualifications used by auditors. The most striking divergences concerned the small companies and the going concern qualifications. In both cases, users felt these qualifications were more serious than did accountants.

References

Adelberg, A. H., 'Narrative Disclosures Contained in Financial Reports: Means of Communication or Manipulation', *Accounting and Business Research*, Summer 1979: 179–190.

Alderman, C. W., 'An Empirical Analysis of the Impact of Uncertainty Qualifications on the Market Risk Components', *Accounting and Business Research*, Autumn 1979: 258–266.

Bailey, K. E., J. H. Bylinski and M. D. Shields, 'Audit Report Wording Changes', *Journal of Accounting Research*, Autumn 1983: 355–370.

Bailey, W. T., 'The Effects of Audit Reports on Chartered Financial Analysts' Perceptions of the Sources of Financial-Statement and Audit-Report Messages', *Accounting Review*, October 1981: 882–896.

Ball, R., R. G. Walker and G. P. Whittred, 'Audit Qualifications and Share Prices', *Abacus*, June 1979: 23–34.

Banks, D. W. and W. R. Kinney, 'Loss Contingency Reports on Stock Prices—An Empirical Study', *Journal of Accounting Research*, Spring 1982: 240–254.

Baskin, E. F., 'The Communicative Effectiveness of Consistency Exceptions', *Accounting Review*, January 1972: 38–51.

Craswell, A. T., 'Studies of the Information Content of Qualified Audit Reports', *Journal of Business Finance and Accounting*, Spring 1985: 93–116.

Chow, C. W. and S. J. Rice, 'Qualified Audit Opinions and Share Prices—An Investigation', *Auditing: A Journal of Practice and Theory*, Fall 1982: 35–53.

Davis, R. S., 'An Empirical Evaluation of Auditors "Subject to" Opinions', *Auditing: A Journal of Practice and Theory*, Fall 1982: 13–32.

Dodd, R., N. Dopuch, R., Holthausen and R. Leftwich, 'Qualified Audit Opinions and Stock Prices: Information Content, Announcement Dates and Concurrent Disclosures', *Journal of Accounting and Economics*, Vol. 6, 1984: 3–38.

Dopuch, N., R. W. Holthausen and R. W. Leftwich, 'Abnormal Stock Returns Associated with Media Disclosures of "Subject to" Qualified Audit Opinions', *Journal of Accounting and Economics*, Vol. 8, 1986.

Elliott, J. A., '"Subject to" Audit Opinions and Abnormal Security Returns; Outcomes and Ambiguities', *Journal of Accounting Research*, Autumn 1982: 617–638.

Estes, R., *The Auditor's Report and Investor Behaviour*, Lexington Books, 1982.

Estes, R., and M. Reimer, 'A Study of the Effect of Qualified Auditors' Opinions on Bankers' Lending Decisions', *Accounting and Business Research*, Autumn 1977: 250–259.

Estes, R., and M. Reimer, 'An Experimental Study of the Differential Effect of Standard and Qualified Auditors' Opinions and Investors' Price Decisions', *Accounting and Business Research*, Spring 1979: 157–162.

Felix, W. L. and W. R. Kinney, 'Research in the Auditors' Opinion Formulation Process: State of the Art', *Accounting Review*, April 1982: 245–271.

Firth, M., 'Qualified Audit Reports and Bank Lending Decisions', *Journal of Bank Research*, Winter 1979: 273–241.

Firth, M., 'The Impact of Audit Qualifications on Lending and Credit Decisions', *Journal of Banking and Finance*, September 1980: 257–268.

Firth, M., 'Qualified Audit Reports: Their Impact on Investment Decisions', *Accounting Review*, July 1978: 642–650.

Foster, G., 'Accounting Policy Decisions and Capital Market Research', *Journal of Accounting and Economics*, March 1980: 29–62.

Gul, F. A., 'The Effects of Uncertainty Reporting on Lending Officers' Perceptions of Risk and Additional Information Required', *Abacus*, September 1987: 172–181.

Gwilliam, D. R., *A Survey of Auditing Research*, Institute of Chartered Accountants in England and Wales and Prentice-Hall, 1987.

Houghton, K. A., 'Audit Reports: Their Impact on the Loan Decision Process and Outcome: An Experiment', *Accounting and Business Research*, Winter 1983: 15–20.

Houghton, K. A., 'True and Fair View: An Empirical Study of Connotative Meaning', *Accounting, Organizations and Society*, Vol 12, No. 2, 1987: 143–152.

Libby, R., (1979a) 'The Impact of Uncertainty Reporting on the Loan Decision', *Journal of Accounting Research* (Supplement 1979): 35–37.

Libby, R. (1979b), 'Bankers' and Auditors' Perceptions of the Message Communicated by the Audit Report', *Journal of Accounting Research*, Spring, 1979: 99–112.

Oliver, B. L., 'The Semantic Differential: A Device for Measuring the Interprofessional Communication of Selected Accounting Concepts', *Journal of Accounting Research*, Autumn 1974: 299–316.

Osgood, C. E., G. J. Suci and P. H. Tannebaum, *The Measurement of Meaning*, University of Illinois Press, 1957.

Robertson, J. C., 'Analysts' Reactions to Auditors' Messages in Qualified Reports', *Accounting Horizons*, June 1988: 82–89.

JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents

Volume 11, Number 4
September, 1989

Editorial Data
Jane A. Ou and Stephen H. Penman
Financial Statement Analysis and the Prediction of Stock Returns
Bipin B. Ajinkya and Prem C. Jain
The Behavior of Daily Stock Market Trading Volume
Jacob K. Thomas
Why Do Firms Terminate Their Overfunded Pension Plans?
H. Fred Mittelstaedt
An Empirical Analysis of the Factors Underlying the Decision to Remove Excess Assets from Overfunded Pension Plans
Advertisements

JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents

Volume 12, Number 1–3
January, 1990

- Editorial Data
- *Ronald H. Coase*
  - Accounting and the Theory of the Firm
- *Andrew A. Christie*
  - Aggregation of Test Statistics: An Evaluation of the Evidence on Contracting the Size Hypotheses
- *Richard Leftwich*
  - Aggregation of Test Statistics: Statistics vs. Economics
  - Comments on Christie paper
- *Joanne C. Duke and Herbert G. Hunt III*
  - An Empirical Examination of Debt Covenant Restrictions and Accounting-Related Debt Proxies
- *Eric G. Press and Joseph B. Weintrop*
  - Accounting-Based Constraints in Public and Private Debt Agreements: Their Association with Leverage and Impact on Accounting Choice
- *Paul M. Healy and Krishna G. Palepu*
  - Effectiveness of Accounting-Based Dividend Covenants
- *Joy Begley*
  - Debt Covenants and Accounting Choice
  - Comments on: Duke/Hunt paper
    - Press/Weintrop paper
    - Healey/Palepu paper
- *Shehzad L. Mian and Clifford W. Smith, Jr.*
  - Incentives for Unconsolidated Financial Reporting
- *David H. Malmquist*
  - Efficient Contracting and the Choice of Accounting Method in the Oil and Gas Industry
- *Robert W. Holthausen*
  - Accounting Method Choice: Opportunistic Behavior, Efficient Contracting and Information Perspectives
  - Comments on: Mian/Smith paper
    - Malmquist paper
- *Masako N. Darrough and Neal M. Stoughton*
  - Financial Disclosure Policy in an Entry Game
- *Robert E. Verrecchia*
  - A Discussion of "Financial Disclosure Policy in an Entry Game", by M. Darrough/N. Stoughton
- *James A. Brickley and Leonard D. Van Drunen*
  - Internal Corporate Restructuring: An Empirical Analysis
- *W. Bruce Johnson and Thomas Lys*
  - The Market for Audit Services: Evidence from Voluntary Auditor Changes
- *George Foster and Mahendra Gupta*
  - Manufacturing Overhead Cost Driver Analysis
- Acknowledgement
- Advertisements

Accounting and Business Research, Vol. 20, No. 78, pp. 123–134, 1990

Post-Tax Capital Investment Appraisal: Plant and Machinery

Richard Mole*

Abstract—Tax considerations are important for companies which are no longer tax exhausted. Taxation has a major impact upon project yield and net present value (NPV) for capital investment in plant and machinery. This paper uses the weighted average cost of capital model to demonstrate that the impact of corporate taxation upon NPV need not be in the same direction as the impact upon yield. The NPV is reduced by the nominal 35% rate of corporation tax only when the pre-tax yield is very high; for low yielding projects the post-tax NPV can range from less than zero per cent to over 100% of the pre-tax NPV depending upon the gearing. The tax deductibility of the costs of the debt finance component of capital expenditure has a major and subtle interaction with other parameters which always favours high gearing.

Introduction

The 1984 reform of UK corporation tax, which came into full effect from April 1986, has already had an important impact upon mainstream corporation tax liability. Devereux (1987) has described the joint effects of tax reform and the rapid rise in historical cost profits:

> Both of these have caused an increase in the tax base which has led, in turn, to a steep decline in the proportion of tax-exhausted companies. As a result, mainstream tax liabilities have risen faster than the underlying increase in profits. However in the future this is unlikely to continue... If inflation remains low it is likely that the new [tax] system will eventually yield relatively lower [government] revenues.

There remains considerable uncertainty over the effects of the 1984 reforms, and the uncertainty is not just restricted to questions of the size of government revenue from corporation tax. It is an open question whether analysts at the company level will use appropriate methods when evaluating capital projects. Morgan (1986) looked at the implications of the 1984 reforms for some sixty capital projects which had been previously authorised. She found that 'many projects, including most of the tax sensitive ones, were not formally evaluated. Where returns were evaluated, the methods varied considerably, particularly in the treatment of interest and the tax assumptions made in post-tax appraisals'. In fact only a third of her sample made any post-tax evaluations and only a quarter made post-tax evaluations against a defined yardstick. Less than rigorous methodology is a general feature of the literature which describes capital budgeting processes in practice (e.g. Pike, 1983; and Coulthurst and Sizer, 1984 and 1985).

Post-tax appraisal is now essential because tax considerations are relevant for companies which are no longer tax-exhausted and the effects of the tax reforms are far from neutral for tax paying companies. This paper describes the major impact of corporate taxation upon the net present value (NPV) of capital projects.

Criteria for assessing the effects of corporation tax on investment in plant and machinery

It is generally agreed that capital projects can be appraised on the basis of the net present value (NPV) of incremental cash flows discounted at an appropriate rate. This is so even if companies using formal financial appraisal criteria first screen out unacceptable proposals where the yield (internal rate of return) cannot surpass a hurdle value. In order to apply a consistent test to proposals that remain in contention it is usual to evaluate a project NPV at the company's average (not marginal) cost of capital. What is required for post-tax appraisal is a method which allows for the taxation of cash returns and tax allowance on capital expenditure as well as the tax deductibility of the costs of the debt finance component of the capital employed. The average cost of capital depends upon the company's gearing ratio (the percentage of debt to the total capital base of the company) and the net cost of capital after deducting tax relief is conventionally used to discount the after-tax cash flows. This is the so-called weighted average cost of capital (WACC) model of investment appraisal.

---

*The author is a senior lecturer at the Open Business School, The Open University.

The WACC model is the conventional approach when cash flows in relation to the company, rather than the share or debt holders, are the focus of analysis. It implies a static or slowly evolving level of gearing which is unlikely to be altered by the nature of the capital projects under consideration. It is appropriate when, for example, a company is divisionalised and the divisions appraise investment opportunities leaving the head office to make the financing decisions. It has the merit of displaying a consistent test as between proposals originating across the divisions and several accounting periods. Because the market value of shareholdings reflects the cash flows after corporate taxation and before any individual investor or shareholder taxes which may apply, the maximisation of shareholder wealth is considered, albeit indirectly. Of course the separation of corporate and other tax systems is not always appropriate; Macdonald (1988) considers their interaction and the interested reader is referred to his paper. Here, however, any reference to taxation should be taken as a reference to corporate taxation.

There is an alternative model to the WACC called the adjusted present value model (APV). Here debt interest is deducted to obtain the taxable income to which the rate of tax is applied, and the debt interest is then added back to give the after tax net cash flows: these are discounted by the gross average cost of capital (obtained from the costs of equity and the unrelieved costs of debt). Whether the WACC or APV model is more correct is debatable; the ensuing NPVs are unlikely to differ appreciably. The WACC model is chosen here as it is in common use.

A very simple example demonstrates that the impact of corporate taxation upon project NPV and project yield need not be in the same direction. To simplify the argument it is assumed that, to begin with, the cost of equity is the same as the unrelieved cost of debt. Consider an initial capital expenditure C upon plant and machinery which generates a cash return of R (where $R > C$) after n years (the equipment has zero salvage value). If the cost of capital is K then the pre-tax NPV, written $\mathrm{NPV}_{\text{pre-tax}}$, is

$$\mathrm{NPV}_{\text{pre-tax}} = -C + R(1+K)^{-n} \qquad [1]$$

The pre-tax yield, written $Y_{\text{pre-tax}}$, is the value of K which gives a zero pre-tax NPV, thus

$$Y_{\text{pre-tax}} = [R/C]^{1/n} - 1 \qquad [2]$$

First consider the old system of corporation tax under which capital expenditure qualified for 100% first year allowances (FYA) and the cost of the debt component of capital expenditure was also allowed, provided that the firm was profitable and paying mainstream corporation tax on historical cost profits. Cash returns attracted tax liability at the corporation tax rate $T = 0.52$. Initially it is assumed that the project is financed by debt and that the tax cash flows are immediate rather than lagged. The net cost of capital, j, may then be written:

$$j = (1-T)K \qquad [3]$$

So the post-tax NPV under the old tax system, ${}^{1984}\mathrm{NPV}_{\text{post-tax}}$ was

$${}^{1984}\mathrm{NPV}_{\text{post-tax}} = -C(1-T) + R(1-T)[1+(1-T)K]^{-n} \qquad [4]$$

The 'grossed-up' post-tax yield ${}^{1984}Y$ for comparison with the cost of capital K was

$${}^{1984}Y = \{[R/C]^{1/n} - 1\}/(1-T) \qquad [5]$$

It is not difficult to show that ${}^{1984}\mathrm{NPV}_{\text{post-tax}}$ can exceed the $\mathrm{NPV}_{\text{pre-tax}}$. This occurs when $K > K^*$; for example when $n = 1$ the expressions for pre-tax and post-tax NPVs are equal at K^* where

$$K^* = \{[T^2/4 + R/C(1-T)]^{0.5} - 1 + T/2\}/(1-T) \qquad [6]$$

Figure 1a below shows the simple case where a capital outlay of $C = 1$ results in a cash return of $R = 2$ after $n = 4$ years. The impact of the old tax system here was to increase yield by a factor of $1/(1-T)$ and to increase NPV when $K > 11.5\%$ or to decrease NPV when $K < 11.5\%$. Put another way, the reduction in NPV due to taxation, when expressed as a percentage of the pre-tax NPV, was a variable quantity. This tax impact percentage may be written $\mathrm{TAX}_{\%}$ where

$$\mathrm{TAX}_{\%} = 100\{1 - \mathrm{NPV}_{\text{post-tax}}/\mathrm{NPV}_{\text{pre-tax}}\} \qquad [7]$$

The tax impact percentage was positive when $K < 11.5\%$. But when $K > 11.5\%$ the tax impact percentage was negative and the firm was effectively in receipt of Treasury subsidy. This situation was due to the complex interaction of tax relief on the cost of debt and the nature of the tax cash flows. It should be noted that if the investment had been financed entirely by equity costing K the post-tax NPV would have been a uniform proportion $(1-T)$ of the pre-tax NPV. In such a case the tax impact percentage always reduced NPV, i.e. ${}^{1984}\mathrm{TAX}_{\%} = 100T$, whilst leaving the yield unaffected (Mole, 1987). This is also shown in Figure 1a.

Thus the impact of the old system of taxation upon NPV was not invariably in the same direction as the impact of taxation upon yield. The analysis for the current tax regime proceeds in an identical manner but writing down allowances at 25% per annum on a declining balance basis are substituted for 100% first year allowances. When the tax rate is denoted by $t = 0.35$ and equity finance is employed, then the post-tax NPV for pooled capital expenditure is

$$\begin{aligned} \mathrm{NPV}_{\text{post-tax}} &= -C\left[1-\frac{0.25t}{1-0.75(1+K)^{-1}}\right] \\ &\quad +R(1-t)(1+K)^{-n} \\ &= -C[(1-t)+K(4-t)]/(1+4K) \\ &\quad +R(1-t)(1+K)^{-n} \end{aligned} \qquad [8]$$

Both the post-tax NPV from [8] and the yield for equity funding are always less than the pre-tax values (Mole, 1987), and this is illustrated in Figure 1b by the numerical example under consideration. If, however, the investment is financed entirely by debt the net interest rate k is given by

$$k=(1-t)K \qquad [9]$$

The post-tax NPV under the new tax system, $\mathrm{NPV}_{\text{post-tax}}$, may be written after some manipulation as

$$\begin{aligned} \mathrm{NPV}_{\text{post-tax}} &= -C(1-t)[1+K(4-t)]/ \\ &[1+4K(1-t)]+R(1-t)[1+(1-t)K]^{-n} \end{aligned} \qquad [10]$$

Expressions for the post-tax yield and tax impact percentage are too complicated to be written out here but it is not difficult to show that the $\mathrm{NPV}_{\text{post-tax}}$ financed by debt in [10] may exceed the pre-tax NPV in [1]. For example, expression [10] will be positive at a rate of interest numerically equal to the pre-tax yield $Y_{\text{pre-tax}}$ if n is larger than the quantity n^*, where

$$n^*=\frac{\mathrm{Log}(1+3.65Y_{\text{pre-tax}}) - \mathrm{Log}(1+2.6Y_{\text{pre-tax}})}{\mathrm{Log}(1+Y_{\text{pre-tax}}) - \mathrm{Log}(1+0.65Y_{\text{pre-tax}})} \qquad [11]$$

In the numerical example, $n^*=2.2$ and since $n=4$ the pre-tax and post-tax lines for debt finance intersect in Figure 1b. This demonstrates that the impact of the new tax system upon NPV need not be in the same direction as the impact upon yield. Once again, the impact percentage (the reduction in NPV due to taxation expressed as a percentage of the pre-tax NPV) is a variable quantity taking positive or negative values in this example.

To summarise, the impact of taxation upon NPV and yield need not be in the same direction either for the old or the new tax regimes. This finding calls into question the utility of investigations which focus primarily upon the impact of taxation upon yields. The Treasury (HMSO, 1984) summarised the expected impact of the 1984 tax reforms upon capital projects, subject to the caveat that 'no simple set of numbers can capture the full complexity of the [tax] system', by showing the pre-tax yield (internal rate of return) needed to earn 5% real net of tax. The method of calculation was based on the work of King and Fullerton (1984) and the results are reproduced in Table 1 below.

Figure 1a
NPVs for the pre-1984 tax regime
$C=1\quad R=2\quad n=4$

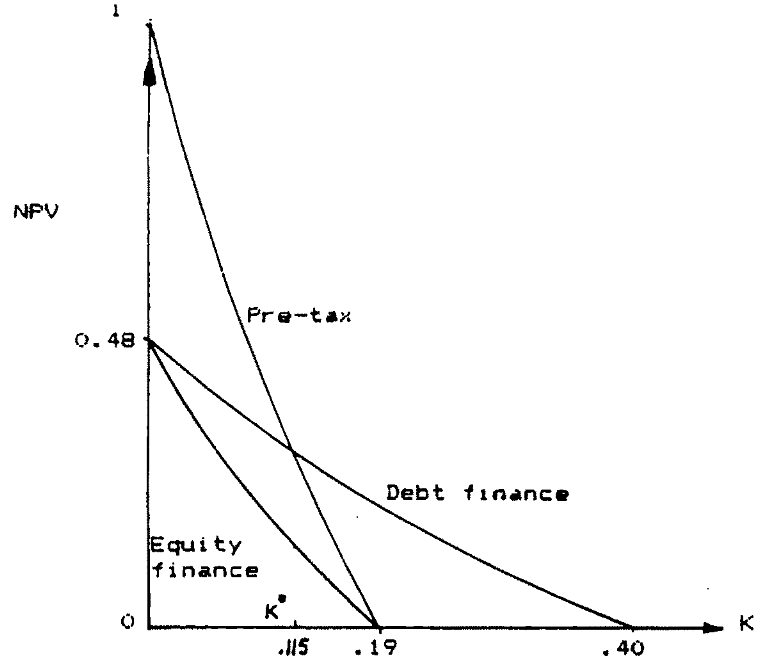
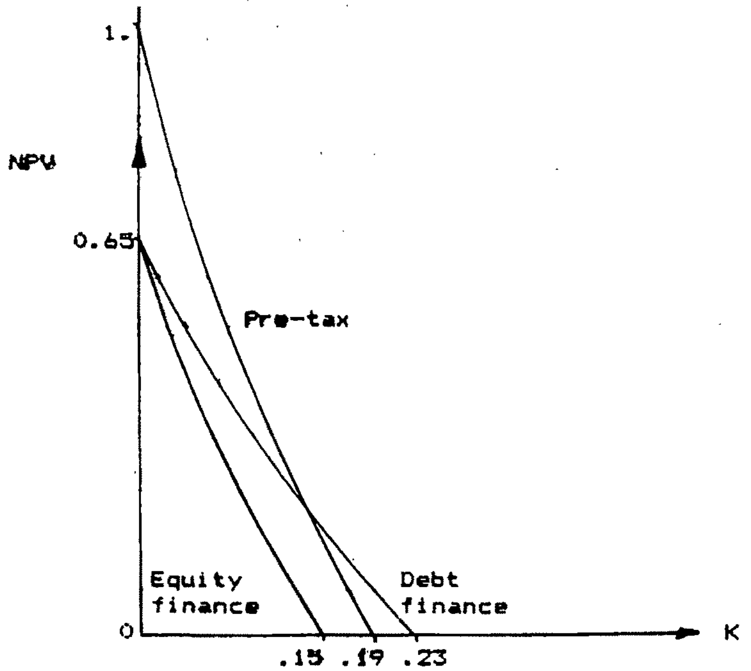


Figure 1b
NPVs for the post-1986 tax regime
$C=1$ $R=2$ $n=4$



The Treasury commented that, for debt finance, 'the large subsidies under the old system are substantially reduced. But while the cost of capital has risen at the margin, some highly profitable projects will do better under the new system.'

However, we have seen that the impact of tax upon NPV need not be in the same direction as the impact of tax on yields. So it was somewhat misleading for the Treasury (HMSO, 1984) to represent the impact of taxation predominantly in terms of changes in yield as in Table 1 above. A more significant measure of the impact of corporate taxation from the company's point of view is the percentage reduction in NPV induced by the system of corporation tax. This is what is meant by the term 'impact percentage' in this paper.

Table 1
The Treasury Rate of Return Calculations, Plant and Machinery. Minimum Pre-Tax Returns Required to Earn 5% Real for Financiers

Assumptions:
5% rate of inflation
10% rate of depreciation
No lag in tax payment
Full tax paying companies

	Debt finance	*Equity finance*
Pre-1984 tax regime	−0.2	2.0
Post-1986 tax regime	2.5	3.1

It is fundamentally erroneous to conclude from Table 1 that the current tax regime affects more or less evenly capital projects financed by debt and by equity. It is also fundamentally erroneous to conclude that equity projects were always less harshly treated before 1984 than after 1986 (the date of the full implementation of the tax reform).

Edwards (1984) explored the impact of tax reform on marginal investments in terms of an 'effective rate of corporation tax'. This was measured as the difference between the cost of capital under a system of corporate taxation relative to the cost of capital without a system of corporate taxation. The cost of capital was defined as the pre-tax return required of a capital investment such that it just met the costs of finance and depreciation. He found that:

> even in the ideal circumstances of zero inflation... the new system still discriminates in favour of debt and against equity finance, and while the increase in the effective tax rates on debt financed investment reduces, but does not eliminate, the tax incentive for uneconomic investment the corresponding increase in the effective tax rates on marginal equity-financed investment has the effect of introducing a tax disincentive to worthwhile investment.

These conclusions, which are fully consistent with the pattern of results in Figure 1, help to illustrate the need to place the interpretation of the data of Table 1 into a broader picture. Edwards investigated a two period investment model, not dissimilar to that at the start of this section with parameter $n = 1$, in which an asset purchased in period 1 yields a gross-of-all-tax return in period 2 and is then immediately sold. However, his choice of criterion for the 'effective rate of corporation tax' is quite different from the investigation of the impact of corporation tax upon NPV which is the subject of this paper.

An illustrative example of the tax impact upon project NPV

The model for the impact of corporation tax upon project NPV from the last section may be generalised to cater for an arbitrary number, N, periods, differing costs of debt and equity, a tax lag and a level of gearing, g. The appendix includes mathematical descriptions of the pre-tax NPV and the post-tax NPVs under the old tax regime (pre-1984) and the new tax regime (from April 1986) as evaluated at the net cost of capital for a specific category of capital projects, with a single capital outlay C, and uniform annual cash returns R over a term of N years. The cost of equity capital is E and cost of debt capital is D. A tax lag of one year is assumed for simplicity. The algebra is more complicated than before and the purpose of this section is to describe a numerical example in order to illustrate the general algebraic relationships.

Figure 2 contrasts the pre-tax and the post-tax NPV under the old tax regime for an illustrative capital project, where $C = 100$, $R = 25$ and $N = 8$. It is assumed that the cost of equity is the same as the gross cost of debt for simplicity, and the abscissa in Figure 2 is the pre-tax (gross) cost of capital. If the target gearing exceeds zero then tax relief upon the cost of servicing the debt component results in a lower post-tax (net) cost of capital; the reduced discount rate provides a progressively higher post-tax yield and post-tax NPV as the gearing increases. The post-tax yield at zero gearing of 18.6% is identical to the pre-tax rate because the cost of capital remains the same and the pre-tax cash flows are uniformly scaled down by the old system of taxation.

The post-tax NPV of the illustrative project under the new tax regime is illustrated in Figure 3 which bears a superficial resemblance to Figure 2. At the very lowest cost of capital the post-tax NPV in Figure 3 is higher than previously shown in Figure 2, suggesting a smaller impact of taxation. But the post-tax lines of Figure 3 have relatively steeper gradients compared with those in Figure 2 giving more rapid reductions in post-tax NPV with increasing cost of capital. For instance, the 15% post-tax yield for zero gearing under the new tax regime is worse than the 18.6% of Figure 2 under the old tax regime.

The tax impact percentage

Consider the illustrative project in a company with a 10% gross cost of capital and a target gearing ratio of 25%. Figure 2 shows that the pre-tax NPV is 33.3 and under the old tax regime the post-tax NPV was 20.6, giving a tax impact percentage of 38%. But under the new tax rules, the pre-tax NPV of 33.3 shown in Figure 3 has become a post-tax NPV of 18.9, giving a 43% tax impact percentage. It is important to establish how the tax impact percentage in this example depends upon the gross cost of capital and the level of gearing.

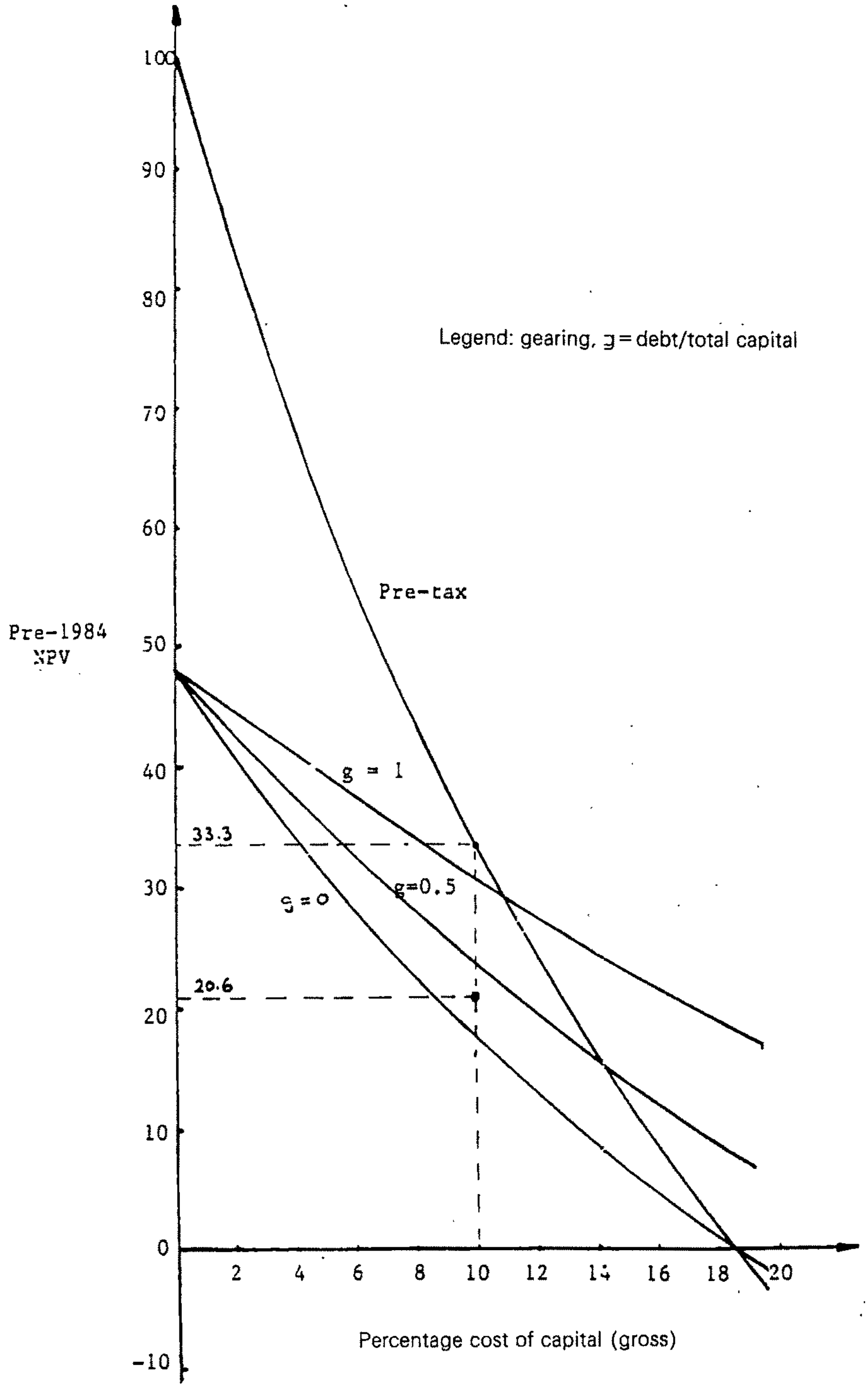
The tax impact percentage may be conveniently calculated from the algebraic results in the appendix. Figure 4 shows the tax impact percentage for the illustrative project under the old tax regime; notice that it is 52% for a zero cost of capital whatever the gearing. The upper line, which corresponds to zero gearing, falls slightly as the cost of capital increases and this is attributable directly to the tax lag. The lines for higher levels of gearing fall quite rapidly, and become negative at a cost of capital well below the pre-tax yield of 18.6%. The extent and magnitude of the Treasury subsidy under the old tax rules is well illustrated.

Figure 5 plots the tax impact percentage for the new tax regime. The top line corresponds to zero gearing, and it grows rapidly from 35% with increasing costs of capital; a draconian 100% of the pre-tax NPV is taxed for a cost of capital of about 15%. When funding is split equally between debt and equity the gearing is 0.5 and the tax impact is a much more reasonable percentage until the pre-tax yield is approached, after which it increases rapidly. For a hypothetical 100% gearing the tax impact in the form of subsidy is much less pronounced than before, and the project carries some taxation when the cost of capital is lower than 12.6%.

Changes in the pattern of the project cash flows lead to changes in the pre-tax yield, but also to changes in the tax impact percentage at a specified cost of capital. Figure 6 is drawn for the class of projects with a duration of $N = 8$ years at a 10% gross cost of capital. It compares the pre-1984 tax impact percentage to the post-1986 impact. It can be seen that the new tax arrangements are less onerous than before for this example when the pre-tax yield exceeds 23% for gearing in the range 0.25 to 0.75, or exceeds 27% for equity finance; but the new arrangements are otherwise more onerous and, for example, the tax impact exceeds 50% for companies financed solely by equity if the pre-tax yield is less than 20%.

The illustrative project from Figure 2 *et seq.* had a pre-tax yield of 18.6% and Figure 6 predicts, as would be expected, both the pre-1984 and post-1986 tax impact percentages upon NPV for a given level of company gearing. The tax impact for this

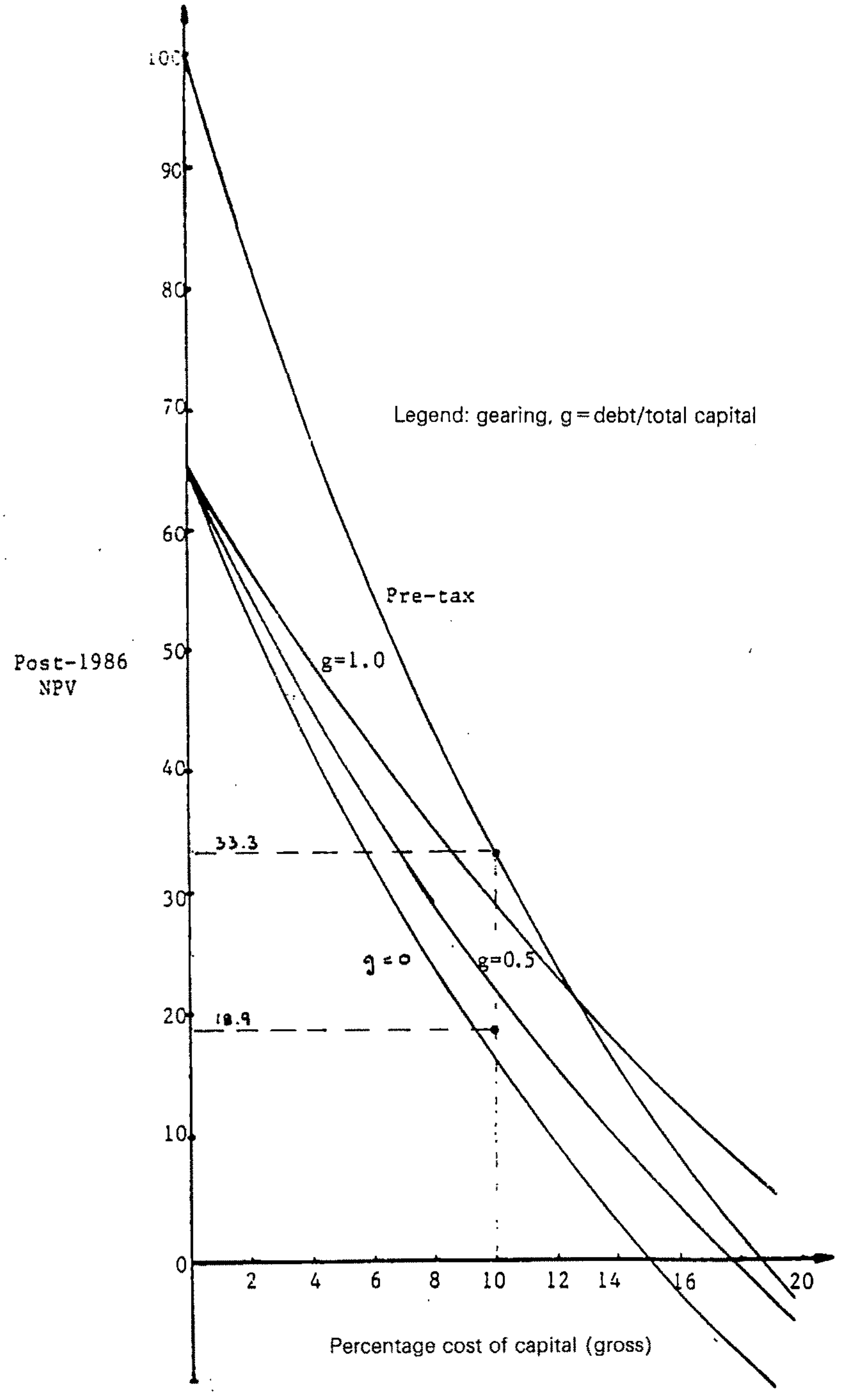
Figure 2
NPVs for pre-1984 tax regime for illustrative project
C = 100 R = 25 N = 8



example has increased by about 5% of pre-tax NPV due to the 1984 Finance Act irrespective of gearing g in the range $g = 0$ to $g = 0.75$, and so there has been little practical reduction in the relative attraction of debt over equity capital in this instance.

The argument has implicitly assumed that the gearing is taken as exogenous; if it is subject to a policy change as a result of the tax reform the analysis still holds but it would be necessary to compare the correct lines on Figure 6 to reflect the old gearing under the old tax regime and the revised gearing under the current system.

Figure 3
NPVs for post-1986 tax regime for illustrative project
C = 100 R = 25 N = 8



The Treasury (HMSO, 1984, Appendix 10) adduced an economic advantage of the new system as follows: 'Subsidised low yielding investment will be discouraged and higher investment encouraged'. This is true but only half the story. Low yielding investment remains in receipt of subsidy for highly geared companies, whereas low yielding projects financed by equity are very strongly discouraged by excessive taxation. The taxation of higher yielding investment is progressively less distorted at around 25% to 35% of the pre-tax NPV.

Conclusion

The impact of corporate taxation has tended to be discussed by the Treasury (HMSO, 1984) in

Figure 4
The pre-1984 percentage tax impact on NPV for illustrative project
$C = 100 \quad R = 25 \quad N = 8$

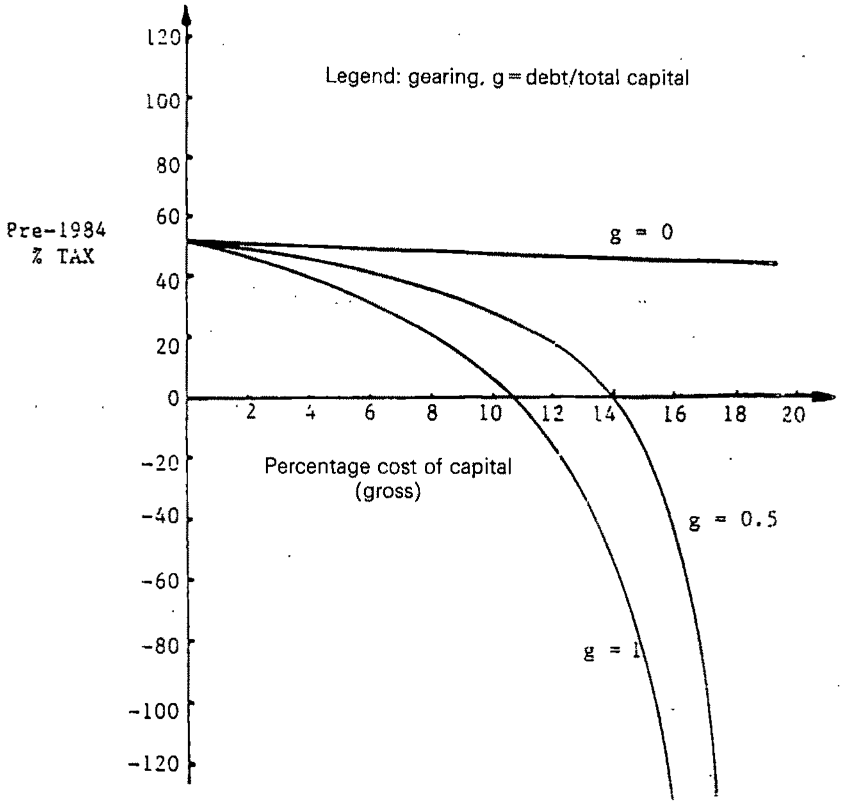


Figure 5
The post-1986 percentage tax impact on NPV for illustrative project
C = 100 R = 25 N = 8

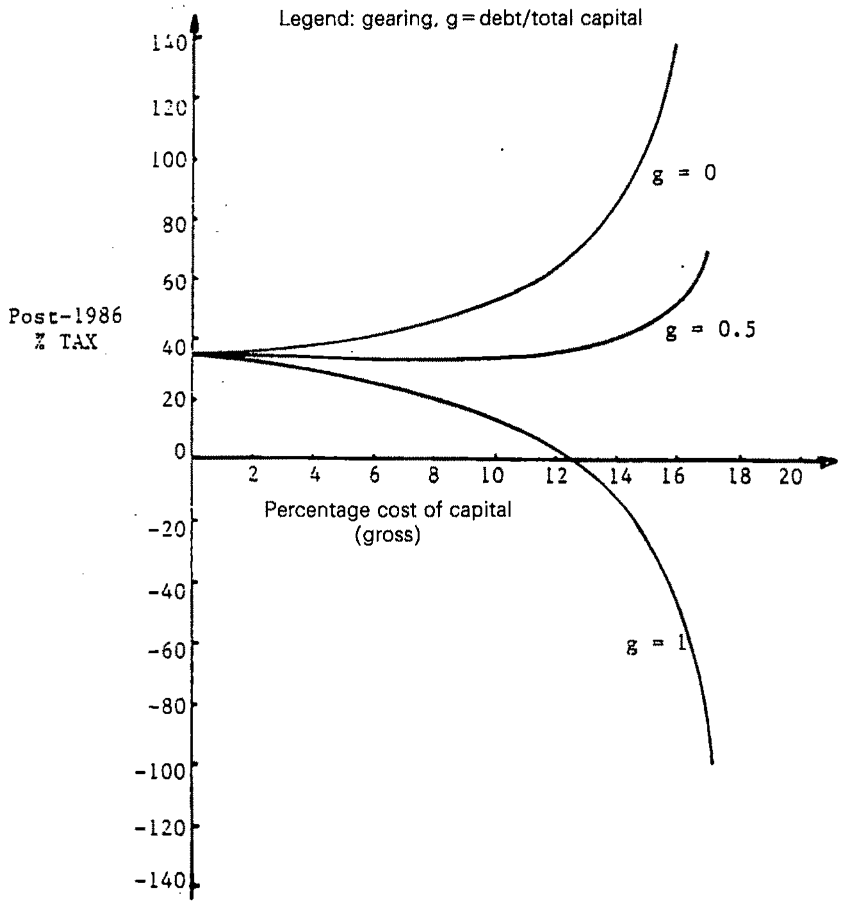
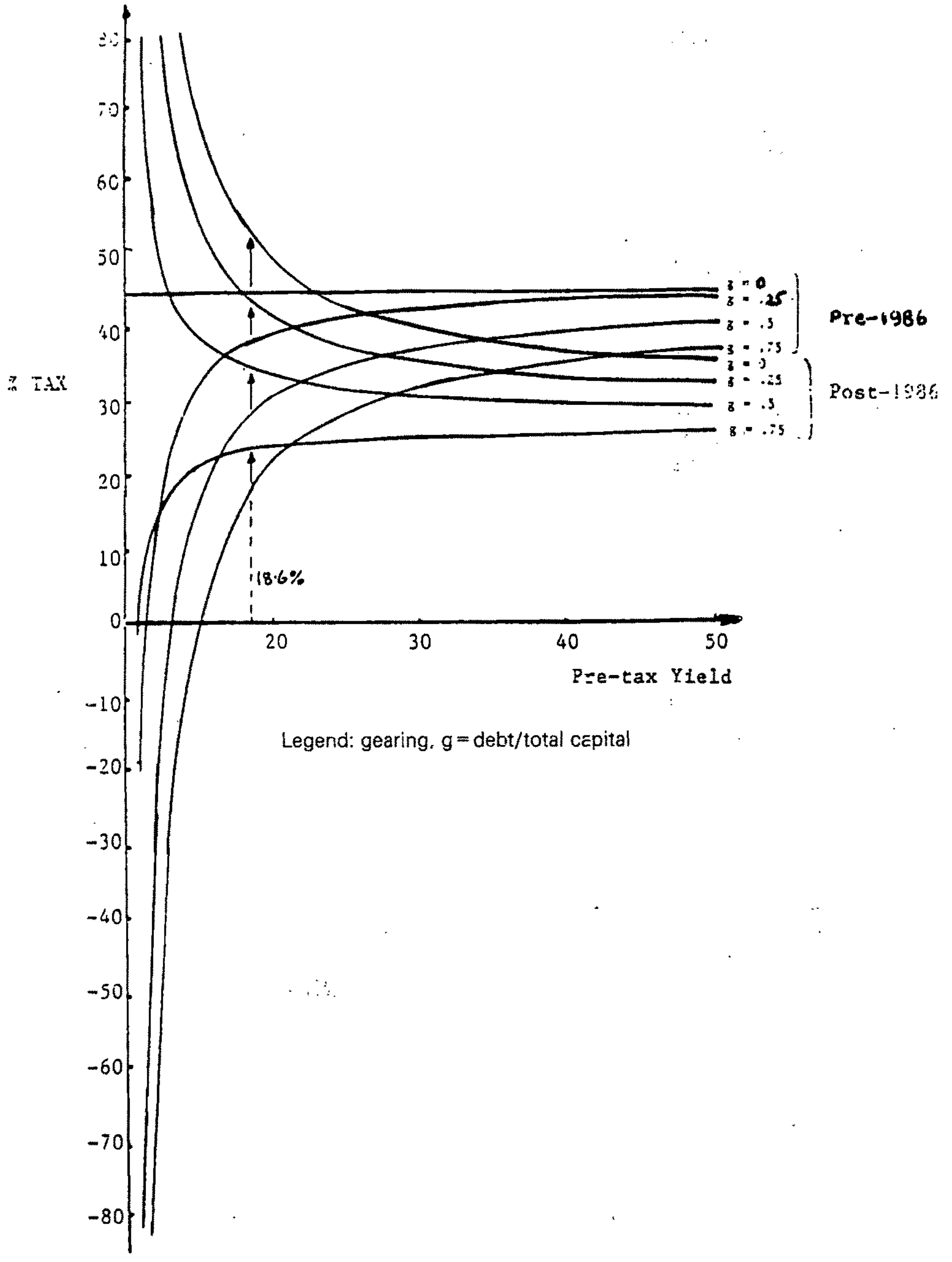


Figure 6
The percentage tax impact on pre-tax NPV for N = 8 year projects for 10% gross cost of capital



terms of the effects on yield but this can be quite misleading. There are seen to be huge variations in the tax impact when formulated in terms of the percentage reduction in project NPV using the WACC model for post-tax NPV. The tax impact percentage depended upon the pre-tax yield and project duration together with the company's gearing and gross cost of capital for the class of projects considered in this paper. At one extreme the tax impact percentage in NPV terms amounted to a Treasury subsidy since the post-tax NPV exceeded the pre-tax NPV. At the other extreme, swingeing taxation in excess of 100% of the pre-tax NPV resulted in a negative post-tax NPV. Sensitivity analyses of changes in the cash flows, monetary inflation, the relative cost of debt to equity, working capital requirements etc. have been reported elsewhere (Mole, 1988).

The Treasury, in advance of the enactment of the 1984 Finance Act (HMSO, 1984, Appendix

10), stated that '... the distortions introduced into decision-making by the tax system are substantially reduced by the Budget proposals.' This could be more accurately restated as '... the distortions introduced into decision-making by the tax system are substantially reduced only when projects enjoy a high pre-tax yield. Distortions in the case of low yielding projects may be reduced somewhat but only for very highly geared companies and this is at the expense of the introduction of a further distortion in the form of a quite extreme excess burden for companies with low gearing.'

The findings strongly suggest that it is no longer adequate for most companies to appraise capital investment on a pre-tax basis. They also suggest that companies may face interpretation problems if superficial attempts are made to reconcile pre-tax and post-tax NPVs. The tax deductibility of the costs of the debt component of invested capital has a complex interaction within the WACC model, with the tax cash flows per se which may result in a post-tax NPV in any given case at variance with what might be expected on the basis of the pre-tax NPV and the nominal 35% rate of corporation tax.

References

Coulthurst, N. and Sizer, J. (1984 and 1985), *A Casebook of British Management Accounting*, Vols I and II, Institute of Chartered Accountants in England and Wales.

Devereux, M. (1987), 'On the Growth of Corporation Tax Revenues', *Fiscal Studies*, Vol. 8, Part 2, pp. 77–85.

Edwards, J. (1984), 'The 1984 Corporation Tax Reform', *Fiscal Studies*, Vol. 5, Part 2, pp. 30–44.

HMSO (1984), *Fourth Report from the Treasury and Civil Service Committee. The 1984 Budget*, HMSO, London.

King, M. A. and Fullerton, D. (1984) *The Taxation of Income from Capital*, University of Chicago Press.

Macdonald, G. (1988) 'An Analysis of the Reformed Corporation Tax: A Comment and an Extension', *Accounting and Business Research*, Vol. 18, No. 72, pp. 371–374.

Mole, R. H. (1987) 'An Analysis of the Burden of Corporation Tax upon Investment of Retained Profits in Plant and Machinery', *Accounting and Business Research*, Vol. 17, No. 68, pp. 311–318.

Mole, R. H. (1988) 'Gearing and Other Influences upon Corporation Tax levied on Capital Investment in Plant and Machinery', Banking Centre Occasional Paper No. 49, Loughborough University.

Morgan, E. J. (1986), *Corporate Taxation and Investment*, Gower, London.

Pike, R. H. (1983) 'A Review of Trends in Formal Capital Budgeting Processes', *Accounting and Business Research*, Summer 1983.

Appendix

Modelling the impact of corporation tax upon NPV

It is assumed that a company is trading profitably, is currently paying corporation tax at rate t, and that project cash flows are free from error. The particular class of investment considered here requires initial capital C at the start of year 1, and produces uniform cash returns R at the end of years $1, 2, \ldots, N$. There is zero scrap value. Consider the pre-tax NPV at the start of year 1, $\text{NPV}_{\text{pre-tax}}$ say, in which the cash flows are discounted by a multiplicative annual discount factor F.

$$\begin{aligned}\text{NPV}_{\text{pre-tax}} &= -C + R[F + F^2 + F^3 + F^4 + \cdots + F^N] \\ &= -C + RF(1 - F^N)/(1 - F) \\ &= -C + R/K(1 - F^N) \qquad \text{[A1]}\end{aligned}$$

where the pre-tax multiplicative discount factor, F, is given by

$$F = (1 + K)^{-1} \qquad \text{[A2]}$$

for a gross average cost of capital K.

If the cost of equity is the decimal annual rate E and the cost of debt is the decimal annual rate D then the gross (i.e. pre-tax) cost of capital K is given by

$$K = (1 - g)E + gD$$

or

$$= E[1 + g(m - 1)] \qquad \text{[A3]}$$

where the target gearing ratio of debt capital to debt plus equity capital is denoted by g and the capital cost ratio $m = D/E$, the ratio of the cost of debt to equity.

The pre-tax yield, $Y_{\text{pre-tax}}$, is that value for K in expression [A2] for which expression [A1] is reduced to zero.

The net cost of capital, k, can be expressed as follows on the assumption that relief from corporation tax at rate t is obtained upon the cost of debt after a one year lag

$$k = (1 - g)E + gD(1 - t/(1 + k))$$

or

$$= E[1 + g(m - 1) - gmt/(1 + k)] \qquad \text{[A4]}$$

This is a quadratic in k and various solution methods are available. The net discount factor, f, may be used to determine $\text{NPV}_{\text{post-tax}}$, the post-tax net present value of the project, where

$$f = (1 + k)^{-1} \qquad \text{[A5]}$$

The tax impact percentage in present value terms, $\text{TAX}_{\%}$, is defined below (note that if $\text{NPV}_{\text{pre-tax}}$ is smaller than $\text{NPV}_{\text{post-tax}}$ then there is a tax subsidy which shows up as a negative tax impact):

$$\text{TAX}_{\%} = 100(1 - \text{NPV}_{\text{post-tax}}/\text{NPV}_{\text{pre-tax}}) \quad \text{for } \text{NPV}_{\text{pre-tax}} >= 0 \qquad \text{[A6]}$$

On summing the geometric progression of writing down allowances at 25% per annum on a declining balance basis the NPV of the tax payments, $\mathrm{NPV}_{\mathrm{tax}}$, can be written:

$$\mathrm{NPV}_{\mathrm{tax}} = Rtf/k(1-f^N) - Ct\,0.25f/(1-0.75f) \qquad \text{[A7]}$$

The post-tax NPV, $\mathrm{NPV}_{\text{post-tax}}$, will be the difference between the numerical value of the expression for the pre-tax NPV when evaluated at the net discount rate f (not F) and $\mathrm{NPV}_{\mathrm{tax}}$. Thus

$$\begin{aligned}\mathrm{NPV}_{\text{post-tax}} &= -C + R/k(1-f^N) - \mathrm{NPV}_{\mathrm{tax}}\\ &= -C + R/k(1-tf)(1-f^N)\\ &\quad + Ct\,0.25f/(1-0.75f) \qquad \text{[A8]}\end{aligned}$$

The net yield, y, is that value k in [A5] such that the above expression is reduced to zero. The 'grossed up' yield, Y, can be obtained from the following relationship based on [A3] and [A4]

$$Y = \frac{y[1+g(m-1)]}{[1+g(m-1)-gmt/(1+y)]} \qquad \text{[A9]}$$

The expressions for $\mathrm{NPV}_{\text{pre-tax}}$ from [A1] and for $\mathrm{NPV}_{\text{post-tax}}$ from [A8] may be substituted into [A6] for $\mathrm{TAX}_{\%}$ to give

$$\mathrm{TAX}_{\%} = \frac{\begin{aligned}100\{1 - C + R/k(1-0.35f)(1-f^N)\\ + Ct0.25f/(1-0.75f)\}\end{aligned}}{-C + R/K(1-F^N)} \qquad \text{[A10]}$$

Upon substitution for K from [A3] and k from [A4] into identities [A2] and [A5] one finds

$$F = \frac{f[1+g(m-1)-gmtf]}{[1+g(m-1)-gmtf^2]} \qquad \text{[A11]}$$

Consequently the tax impact percentages, $\mathrm{TAX}_{\%}$ from [A10], can be regarded as a function of seven variables C, R, f, N, t, g, m although it is impracticable to write it out in full. Furthermore, since k can be numerically evaluated using [A4] from the costs of debt D and equity E and the capital gearing g then, in turn, f may be evaluated from [A5]. Thus the tax impact percentage can be systematically related to variations in the parameters of the following list:

Cash flows, R, C
Cost of equity capital, E
Gross cost of debt capital, D
Tax rate, t
Capital gearing, g
Project Duration, N

The old tax impact percentage $^{1984}\mathrm{TAX}_{\%}$ attributable to the old tax regime may be compared with $\mathrm{TAX}_{\%}$ under the new regime from [A11] for the minority of companies which were not 'tax-exhausted' prior to 1984 (ignoring the withdrawal of stock relief).

The net present value $^{1984}\mathrm{NPV}_{\mathrm{tax}}$ of the pre-1984 tax liability with 100% first year capital allowances and a rate of corporation tax, T, can be written

$$^{1984}\mathrm{NPV}_{\mathrm{tax}} = RTd/j(1-d^N) - CTd \qquad \text{[A12]}$$

where the net discount factor $d = 1/(1+j)$ for a net interest rate j as found from

$$j = (1-g)E + gD(1 - T/(1+j)) \qquad \text{[A13]}$$

The calculation of the old tax impact $^{1984}\mathrm{TAX}_{\%}$ and the old gross yield, ^{1984}Y, follows in the previously established manner. Notice that $^{1984}\mathrm{NPV}_{\mathrm{tax}} = \mathrm{TdNPV}_{\text{pre-tax}}$ when $g = 0$ and so $^{1984}\mathrm{TAX}_{\%}$ is then just $100T/(1+E)$ giving an after-tax yield identical to the pre-tax yield.

Accounting and Business Research, Vol. 20, No. 78, pp. 135–141, 1990

The Role of Profitability in Divisional Decision Making and Performance Evaluation

R. C. Skinner*

Abstract—The use of profitability, typically in the form of return on investment, to assess divisional financial performance has been widely criticised, since it involves the allocation to divisions of central fixed costs. The measure is, however, extensively used. Prior surveys have indicated economic reasons for use of the measure, but the justification supplied has been incomplete. The survey reported in this paper found evidence for the same economic reasons, but it has also provided additional justification. The new finding is that the measure is widely used for making inter-division and inter-firm comparisons.

Introduction

The conventional wisdom, as reflected in most of the management accounting literature, is that the costs of central services and central administration ought not to be allocated to divisions. Such costs can only be controlled where they are incurred, which means that they can be controlled only by the managers of the service departments and by central management. Long-run decisions, also, can be made only by the same managers. The opposition to allocation probably applies only to fixed costs. Both cost-volume-profit analysis, which requires the identification of all variable costs, and standard cost variance analysis on variable overhead, are generally regarded as being managerially useful. Most of the costs of central facilities, however, are likely to be fixed.[1] The preferred divisional measures are usually suggested to be contribution margin (sales less all variable costs), segment margin (contribution margin less the direct fixed costs of the division), or controllable profit (or income). The nature of the last measure depends on the organisation structure of the business, but it is typically assumed to exclude at least the fixed costs of central facilities.

Surveys in a variety of countries, however, have shown that about 70 per cent of divisionalised companies use profit, most often in the form of return on investment ratios, as their main measure of divisional financial performance. The survey reported in this paper, carried out in Australia and New Zealand, showed approximately the same proportion. Earlier surveys have been carried out in the USA (Reece and Cool, 1978; Vancil, 1979; and Fremgen and Liao, 1981), in the UK (Tomkins, 1973) and Australia (Chenhall, 1979).

The term 'profit' (or 'income') is not unambiguous. Strictly speaking, it requires the allocation of the costs of all central facilities, with the exceptions, frequently, of interest expense and tax, so that the profit of all the divisions added together equals the profit of the company. Some accountants, however, use the term to include various types of contribution or segment margin. This was the case with some of the respondents to both the Reece and Cool (1978) survey and the survey reported in this paper. In the former, nearly all the respondents claimed to use profit centres or investment centres (p. 29), but a later question revealed (p. 36) that a little under 30 per cent of those who made this claim did not allocate administration expense to their divisions. The adjective 'net' is used below to indicate profit after the allocation of central costs; the figure of 70 per cent quoted above relates to the use of net profit in that sense.

Reasons for allocating

Prior surveys have provided little understanding of how and why net profitability is used. The best survey in this respect is Fremgen and Liao (1981), but those researchers' 'reasons' for allocating are sometimes not reasons at all. For example, the

---

*The author is senior lecturer in accounting at Monash University. He is grateful to the staffs of the accounting departments of the Universities of Auckland, Waikato, Canterbury and Otago for help in carrying out the New Zealand portion of the research reported in this paper.

[1] Typical central services are research and development, data processing, purchasing, personnel management, and credit control (see Solomons, 1965, pp. 15–16). The costs of these and of central administration are likely to be predominantly the fixed costs of salaries and of rent or depreciation on buildings and equipment. The questions asked in the survey did not, however, differentiate between variable and fixed costs.

most frequently quoted performance evaluation reason was to 'remind profit centre managers that indirect costs exist and that profit centre earnings must be adequate to cover some share of these costs' (p. 61). That raises the questions as to what purpose this type of reminder serves, and why earnings must be adequate in that sense.[2] The third most frequently quoted performance evaluation reason was to 'relate profit centre earnings to total company profit so that the sum of all centres' profits is equal to company profit' (p. 61). That is not a reason for allocating (in other words, for using profit): it is part of the definition of 'profit'. That survey did, however, reveal some genuine reasons for allocating, and these are discussed below. The survey reported here was designed to add to our knowledge of reasons.[3]

In the Fremgen and Liao survey (1981, p. 68), 49 per cent of those who allocated did so because they believed that allocated full costs were the best available estimates of long-run incremental costs. If this belief is correct, such data will obviously be helpful in strategic decision making. Long-run decision making relating to a division is likely to involve both central and divisional management; in other words, decision-making responsibility will be divided. The survey by Baumes (1963, pp. 8, 34 and 70) found that the allocation of the costs of a service often leads to questioning the internal provision of the service or the level at which it is supplied internally. This reason for allocating has appeared in no survey other than that of Baumes (now over 25 years old); it was a commonly cited reason in my survey.

In studying performance evaluation, it is desirable to distinguish at least one intermediate stage between full control and no control by an individual manager. McNally (1980) has argued that control typically lies along a continuum. That view is original to him; he attributes it to others (p. 170), but the idea is not to be found in the sources he cites. McNally suggests recognising several intermediate steps. Skinner (1986) has suggested one intermediate step, which he calls 'influence'. The user of a service can influence the cost of providing it (the variable cost, at least), because he controls the efficiency of its use; the supplier can also influence the cost through controlling the efficiency of its supply. One reason for allocating, therefore, is that it encourages profit centre managers to put pressure on service department managers to do a better job of controlling their costs. In the Fremgen and Liao survey (1981, p. 61) that was a reason cited by 46 per cent of those who allocated. In my survey, it was in most cases given as a reason for allocating both central administration and central service costs.[4]

In the literature it is commonplace to distinguish between the performance of a division and the performance of its manager. It is seldom made clear, however, what the distinction involves. It is possibly a way of distinguishing between long-run decision making and the evaluation and control of performance. Those uses were studied separately in the Fremgen and Liao survey and in this one. On the other hand, it may involve the attempt to separate the impact of the manager from the effect of the resources of the division that any other manager of it would have at his disposal. An attempt to do so has been made using multivariate analysis (Kinney, 1969), but there has been remarkably little academic interest in this type of approach since. None of the respondents to this survey thought it practicable to make that kind of distinction.

It has been suggested by Zimmerman (1979) that cost allocation can induce a subordinate to act as a monitor of his superior's consumption of perquisites. None of my respondents gave that as a reason for allocating. Many non-economic explanations of accounting behaviour have been suggested, for example, political, cultural and ideological. Only one reason of that type emerged, and this could be classed as ritualistic. In one company (in New Zealand) the accountant could indicate no reason for the use of profit, other than that it was regarded as the accepted way of measuring divisional financial performance. In two other companies (in Australia) a major reason for using return on investment was that it is the 'done thing', although there were economic reasons as well. That justification is classified in the results reported below as 'tradition'.

Apart from the ability of divisional managers to affect central costs in a number of ways, there is another economic justification for the use of profitability. This is for purposes of inter-division and inter-firm comparisons. The latter can take the form of comparing the results of a division with those of whole companies outside, or with the results of divisions in other companies. It is not possible to compare dollar amounts between businesses, whether of profit, contribution margin, segment margin or residual income. Ratios are needed, of which return on investment is likely to be the most useful. Apart from the need to deflate for size in a meaningful way, it is not possible to compare companies using financial results which ignore central costs. Companies differ in the types of service and the level of administration provided centrally rather than within each division, so that the omission of central costs would destroy comparability.[5]

---

[2] Their survey enquired separately about the uses of allocation for cost-based pricing and other decision-analysis purposes.

[3] Little attention, I suggest, needs to be paid to the general arguments against allocation associated most often with the name of Thomas (1974, particularly). The case against Thomas's viewpoint is presented in Skinner (1986). The major point is not whether allocations are 'incorrigible' and 'arbitrary' (in Thomas's senses of those terms), but whether or not they are useful.

[4] Merchant (1987) has suggested amending the controllability principle to incorporate an agency theory perspective but, as he recognises, that perspective does not concede that divisional managers can influence central fixed costs.

The survey

The survey was carried out by means of telephone conversations with those in charge of the management accounting systems in a number of New Zealand and Australian companies. A wide variety of accounting titles was encountered, the main ones being financial (or group, or corporate) controller, and chief (or group, or corporate) accountant. An advantage of this type of survey is that there was almost no non-response problem. As with face-to-face interviews, the questions could be, and were, open ended.

As a result of a pilot survey carried out by a graduate student, it was decided to confine the enquiry to companies (or groups) with head offices in the cities where the enquiries were conducted. This was because, where the head office is elsewhere (particularly overseas), it is difficult to feel confident that the local management accountant always knows the reasons for the choice of accounting measure being used. Enquiries were made of companies which were not subsidiaries of others in four New Zealand cities—Auckland, Hamilton, Christchurch and Dunedin. The aim was to contact all the diversified companies with head offices in those cities.[6] The Australian sample was drawn from *Australia's Top 500 Companies, 1987–88* (Wilson and Findlay, 1987). Contact was made with all the companies listed (other than subsidiaries) which have their head offices in Melbourne. The enquiries were conducted in the second half of 1988.

In a few cases, the companies proved to be subsidiaries of others, or to have their head offices in other cities. Those responses are ignored below. A significant proportion of the other companies proved not to be directly relevant to this enquiry. One reason for that is where each 'division' is a separate, subsidiary company and no management accounting is done by the holding company. It would, of course, make no sense to study the choice between profitability and segment margins in such businesses. Other companies were not divisionalised because they were organised by functions. In some of the divisionalised companies, as expected, central costs were not allocated. These results are summarised below:

Prevalence of Divisionalisation

	NZ Sample		*Aust. Sample*		*Total*	
		(%)		(%)		(%)
(a) Not divisionalised—subsidiaries	7	(16)	5	(7)	12	(11)
(b) Not divisionalised—organised by function	4	(9)	15	(21)	19	(17)
(c) Not divisionalised—other reasons	1	(2)	3	(4)	4	(4)
(d) Divisionalised, but no allocation	4	(9)	17	(24)	21	(18)
(e) Divisionalised, and net profitability used	26	(60)	28	(39)	54	(47)
(f) Reasons (a) and (d) together	—		1	(1)	1	(1)
(g) Reasons (a), (d) and (e) together	—		1	(1)	1	(1)
(h) No response	1	(2)	1	(1)	2	(2)
	43	(98)	71	(98)	114	(101)

Category (c) comprised three cases where the companies each had a single product, and one case of a not-for-profit organisation. The proportion of companies in category (a) was somewhat lower, and that in category (b) was substantially higher, than in the studies by Steer and Cable (1978) and by Hill and Pickering (1986), but their surveys were of the largest UK companies.[7]

Using the chi-squared test, with a correction for continuity, the figures above for the two countries are not significantly different from each other at even the 10 per cent level. With no continuity correction, the differences are significant at the 5 per cent level (but not at 2.5 per cent).[8] Whether significant or not, it does not seem possible to draw any interesting inferences from the differences. A higher proportion of New Zealand companies use net profitability, but it cannot be argued that this represents desirable or undesirable practice.

---

[5] The allocation of central costs and the use of ratios are, of course, necessary but not sufficient conditions for comparability. The desirability of uniform accounting is discussed briefly below. These and other problems of comparability are examined by Ingham and Harrington (1980).

[6] The help given by the four New Zealand universities which are thanked at the beginning of this paper included assistance in identifying these companies.

[7] As indicated by categories (f) and (g), two company groups combined the subsidiary and divisional forms. Some subsidiaries were each responsible for a single product or product line, whereas other subsidiaries were responsible for a variety of products and were divisionalised.

Of the 77 divisionalised companies (categories d, e, f and g), 22 (29 per cent) did not allocate the costs of central services and central administration, which is about the proportion found in prior surveys. It is the 55 companies (categories e and g) which did allocate, and so used some type of net profitability measure, that are of most interest for this study. Return on investment was the most commonly used profitability measure, there being far less use of profit only, and very little use of residual income. In some cases, the use of profitability was claimed where the subsequent question indicated that no central costs at all, or no administration costs, were allocated to divisions. Further questions were not asked of those respondents. A few respondents used the term 'charge out', and their responses have been included among those who allocated. None of those who employed that term allowed divisions a choice between using an internal service and going outside the company. If such a choice were allowed it would, of course, give a division a degree of influence on central service costs beyond that considered in this paper.

The results reported below relate to companies which allocate all, or almost all, their central costs. The 'almost all' category comprised 7 per cent of the total number.[9] Even without a continuity correction, the figures for the two countries are not significantly different at the 20 per cent level.

Nearly all the respondents who used net profitability used it to control divisional performance. As mentioned above, none of those who did so thought it possible to distinguish between the performance of a division and the performance of its manager. Evaluation was primarily by means of budgets and past results, but comparisons with other divisions within the company and with other companies were also fairly common.

Most of the respondents claimed that divisional net profitability data were also useful for strategic decision making by both central and divisional management. As explained in the appendix, some prompting on this issue was needed in order to differentiate corporate level and divisional decision making. The phrase used to indicate long-run analysis was in all cases 'strategic decisions, such as increasing the size of a division or closing one down'. This finding represents evidence, albeit indirect, that fully allocated cost is typically a good estimate of long-run incremental cost. It must be so if the data are to be useful for this purpose. It was decided not to investigate that point more directly as the questions would have needed to become detailed and complex. A separate survey would be needed to add to the information on this point given in the Fremgen and Liao survey (1981, p. 68). The interesting question now is not so much what accountants believe, but whether allocated full cost is in fact the best available estimate of long-run incremental cost. Skinner (1987, p. 78) summarises the evidence from empirical cost studies on this issue. It is very difficult to see, however, how evidence of a direct nature could be obtained.

Types of Net Profit Measure

	NZ Sample		*Aust. Sample*		*Total*	
		(%)		(%)		(%)
Profit only	8	(31)	7	(24)	15	(27)
Return on investment (ROI)	15	(58)	21	(72)	36	(65)
Residual income	3	(12)	—		3	(5)
ROI and residual income	—		1	(3)	1	(2)
	26	(101)	29	(99)	55	(99)

In addition to the two uses discussed above, net profitability was used in a few cases for determining external selling prices and for computing salary bonuses for divisional managers.[10] No respondent mentioned the control of perquisite consumption. With only one exception (a New Zealand company), every respondent cited more than one use. The results were:

---

[8] In applying the test, categories (f) and (g) were distributed over the other categories and category (h) was omitted. The degrees of freedom are, therefore, 4 and the chi-squared values are 7.12 (with continuity correction) and 9.96 (without it). The correction for continuity was proposed by Yates over 50 years ago, but it has been a subject of controversy amongst statisticians ever since. Chi-squared was the only statistical test used in this research.

[9] This category comprised 1 out of 26 companies (4 per cent) in New Zealand and 3 out of 29 (10 per cent) in Australia. Although residual income was specifically enquired about (in question 2), this study, like previous surveys, showed that it is little used. The popularity of inter-division and inter-firm comparisons, reported below, suggests one reason for that. As dollar amounts, residual income figures cannot be compared between business entities of different size.

[10] The small number of companies which use profitability to compute bonus payments is not surprising, since the central costs allocated to divisions would not be fully controllable by their managers. Measures such as segment margin are more likely to be used for that purpose.

Uses of Net Profitability

	NZ Sample (%)		*Aust. Sample* (%)		*Total* (%)	
Control of divisional performance	25	(96)	28	(97)	53	(96)
Corporate long-run decision making	23	(88)	29	(100)	52	(95)
Divisional long-run decision making	21	(81)	26	(90)	47	(85)
Price determination	7	(27)	11	(38)	18	(33)
Bonus payments	—		4	(14)	4	(7)
Tradition	1	(4)	2	(7)	3	(5)

The percentages shown are of the numbers of companies using net profitability, as given in the preceding table. As explained above, 'tradition' is where generally accepted practice was cited as the reason for the use of net profitability, although only in the case of the New Zealand company was that the only reason offered. Clearly, the figures for the two countries show a high degree of similarity.[11]

It was no surprise that most of the respondents evaluated divisional results by comparing them with budgets and with past results. In a significant proportion of the cases, divisional net profitability was evaluated by reference to company-wide rates of return. The novel finding to come out of this survey is the relatively widespread uses of inter-division and inter-firm comparisons. A number of respondents expressed the wish to use inter-firm comparisons but said they were prevented by lack of suitable data. Divisional results can, sometimes, be compared with those of whole companies outside. Such comparisons are likely to be fully satisfactory only where accounting methods have (for this purpose) been standardised, which is likely to be the case only where there is a formal inter-firm comparison scheme operated by the trade or industry association. To compare the results of a division with those of similar *divisions* in other companies is likely to be impossible in the absence of a formal inter-firm comparison scheme, since divisions are unlikely to correspond with the segments used for external financial reporting.

The survey figures were:

Bases of Evaluation

	NZ Sample (%)		*Aust. Sample* (%)		*Total* (%)	
Budgets	25	(96)	28	(97)	53	(96)
Past results	19	(73)	23	(79)	42	(76)
Corporate results	12	(46)	14	(48)	26	(47)
Inter-division comparisons	15	(58)	16	(55)	31	(56)
Inter-firm comparisons	7	(27)	16	(55)	23	(42)

The percentages are of the companies using net profitability, as in the preceding two tables. There were 40 companies (73 per cent) which used either inter-division *or* inter-firm comparisons (or both). To permit financial comparisons between business units, whether divisions or firms, comprehensive measures are needed, usually in the form of ratios. Of the companies which made such comparisons, 34 used net return on investment, 5 used net profit, typically in the form of a rate of return on sales revenue, and 1 used residual income (to compare divisions which are very similar in size). Clearly, the results for the two countries in the above table are very similar, although it is worth noting that inter-firm comparison is twice as common in Australia as in New Zealand.[12]

Given that a major use of profitability data is to control divisional performance, it is a reasonable inference that divisional managers must be able to influence in some way the central costs allocated to them. The question was, however, put explicitly. Where there seemed to be any doubt in the respondent's mind, it was made clear that it was the existence and levels of such costs that were being asked about, not about the ways the costs were divided up between divisions. A few respondents said that divisional managers were able to influence some central costs but not others (for example, service costs but not administration), but most said that all central costs could be influenced.

---

[11] Of the two companies (out of 55) which did not use net profitability to control divisional performance, one was the New Zealand company mentioned in which the only reason for using it was tradition. The other was an Australian company which used the measure for the second, third and fourth purposes listed.

[12] Comparing inter-firm comparisons with all the other types of evaluation added together, the differences between the two countries are not significant at the 10 per cent level, even with no continuity correction.

The responses were:

Ability to Influence

	NZ Sample	(%)	*Aust. Sample*	(%)	*Total*	(%)
All central costs	14	(54)	23	(79)	37	(67)
Some central costs	2	(8)	2	(7)	4	(7)
No central costs	10	(38)	4	(14)	14	(25)
	26	(100)	29	(100)	55	(99)

Combining the first and second categories above, the differences between the two countries are significant at the 5 per cent level without a continuity correction, but not significant at that level with the correction.

As mentioned above, there are two ways recognised in the literature in which divisional managers can influence central costs. Substantial support was found for both types of impact, but no further type of influence was revealed. A divisional manager may be able to exert pressure on service department managers or general managers (or both) to do a better job of controlling central costs. Divisional managers can also raise with general management the question whether it would be better if an existing central service were to be supplied (wholly or partially) either from outside the company or within each division. The results were:

Types of Influence

	NZ Sample	(%)	*Aust. Sample*	(%)	*Total*	(%)
Pressure to control central costs	16	(62)	24	(83)	40	(73)
Questioning provision of central services	16	(62)	25	(86)	41	(75)

The percentages are of the numbers using profitability given in the preceding tables.[13]

There were two inconsistent (or, at least, difficult to interpret) responses to the questions relating to control of performance (one in each country). They were among those who said that divisional profitability figures are useful for that purpose, but they did not use inter-division or inter-firm comparisons, nor did they believe divisional managers could influence central costs. The other 96 per cent of companies (51 out of 53) which use profitability for controlling divisional performance could, however, justify it by one or other of the two explanations mentioned. The proportion is 93 per cent (51 out of 55) of the companies using profitability irrespective of the purposes for which it is used.

Conclusion

The survey of divisional financial performance measurement reported in this paper has indicated economic reasons for the use of net profitability. That measure requires the allocation to divisions of the fixed costs of central services and administration. Such data are used by almost all the respondents for long-run decision making, from which finding it is inferred, on the basis of the prior literature, that fully allocated cost is a good estimate of long-run incremental cost. Profitability data are also used to control divisional performance. There is economic justification for that type of use where the data are used for inter-division or inter-firm comparison, or where divisional managers can affect the levels and existence of the central fixed costs allocated to them. Nearly all the respondents cited one or other of those two justifications. Inter-division and inter-firm comparisons have not been studied in prior surveys.

---

[13] Allocated central capital was not enquired about in this survey. It is a reasonable inference that the effects a divisional manager can have on central fixed costs and on central capital would be similar.

References

Baumes, C. G., *Allocating Corporate Expenses* (Business Policy Study No. 108, National Industrial Conference Board, New York, 1963).

Chenhall, R. H., 'Some Elements of Organisational Control in Australian Divisionalised Firms', *Australian Journal of Management*, vol. 4, no. 1, supplement, April 1979.

Fremgen, J. M. and Liao, S. S., *The Allocation of Corporate Indirect Costs* (National Association of Accountants, New York, 1981).

Hill, C. W. L. and Pickering, J. F., 'Divisionalization, Decentralization and Performance of Large United Kingdom Companies', *Journal of Management Studies*, vol. 23, January 1986, pp. 26–50.

Ingham, H. and Harrington, L. T., *Interfirm Comparison* (Heinemann, London, 1980).

Kinney, W. R., 'An Environmental Model for Performance Measurement in Multi-Outlet Businesses', *Journal of Accounting Research*, vol. 7, Spring 1969, pp. 44–52.

McNally, G. M., 'Responsibility Accounting and Organisational Control: Some Perspectives and Prospects', *Journal of Business Finance and Accounting*, vol. 7, Summer 1980, pp. 165–181.

Merchant, K. A., 'How and Why Firms Disregard the Controllability Principle' in Bruns, W. J. and Kaplan, R. S. (eds.), *Accounting and Management—Field Study Perspectives* (Harvard Business School Press, Boston, Mass., 1987), pp. 316–338.

Reece, J. S. and Cool, W. R., 'Measuring Investment Centre Performance', *Harvard Business Review*, vol. 56, May–June 1978, pp. 28 ff.

Skinner, R. C., 'Cost Allocation in Management and Financial Accounting', *International Journal of Accounting*, vol. 21, Spring 1986, pp. 91–107.

Skinner, R. C., 'Allocations and the Validity of the Incremental Principle', *Accounting and Business Research*, vol. 18, Winter 1987, pp. 75–78.

Solomons, D., *Divisional Performance: Measurement and Control* (Irwin, Homewood, Illinois, 1965).

Steer, P. and Cable, J., 'Internal Organization and Profit: an Empirical Analysis of Large UK Companies', *Journal of Industrial Economics*, vol. 27, September 1978, pp. 13–29.

Thomas, A. L., *The Allocation Problem: Part Two* (Studies in Accounting Research No. 9, American Accounting Association, Sarasota, Florida, 1974).

Tomkins, C., *Financial Planning in Divisionalised Companies* (Haymarket, London, 1973).

Vancil, R. F., *Decentralization: Managerial Ambiguity by Design* (Dow Jones-Irwin, Homewood, Illinois, 1979).

Wilson, J. C. and Findlay, R. J., *Australia's Top 500 Companies, 1987–88* (Riddell, Crows Nest, NSW, 1987).

Zimmerman, J. L., 'The Costs and Benefits of Allocation', *Accounting Review*, vol. 54, July 1979, pp. 504–521.

Appendix

This appendix reproduces the questions asked in the survey and the order in which they were asked. Since the interest of the survey was profitability, Solomons' (1965, p. 4) definition of a division was used. Solomons has argued that divisional profit responsibility can only have meaning where, as a minimum, managers have responsibility for both the sale and the manufacture (or purchase) of specific products.

Question 1

Is your organisation divisionalised; do you have managers who are responsible for both selling and producing/purchasing certain products?

Either the word 'producing' or 'purchasing' was used, as appropriate. Only if the answer was affirmative were further questions asked.

Question 2

(a) Do you compute a profit figure for each division?

(b) If so, do you relate the profit to an investment base, either return on investment or residual income?

Only if the answer to question 2 (a) was affirmative were any further questions asked.

Question 3

Do you allocate to the divisions all the costs of central services and central administration?

Only if all, or almost all, central costs were allocated were subsequent questions asked.

Question 4

For what purposes are the profitability data used?

Question 5

How is the measure used; with what are the figures compared?

Question 6

(a) I realise that divisional managers cannot fully control the central costs allocated to them, but can they influence them?

(b) If so, in what ways can they influence them?

A conscious effort was made to avoid 'leading' respondents, in the hope that unexpected explanations would be revealed, but sometimes prompting could not be avoided. With question 4, very few respondents distinguished between divisional decision making by corporate management and by divisional management until they were specifically asked to do so. In question 5, many respondents who compare current with past results did not say they do so until the use of past results was mentioned to them; that was because, presumably, this type of evaluation is so familiar, in financial as well as management accounting, that respondents considered it too obvious to mention.

CONTEMPORARY ACCOUNTING RESEARCH

Recherche comptable contemporaine

Vol. 6/No. 1/Fall/automne 1989

Contents

Articles
"Strategic Choice of Inventory Accounting Models" W.-O. Jung
"Some Characteristics of the Canadian Audit Industry" R. G. Zind and D. Zéghal
"Caractéristiques du secteur de la vérification au Canada" R. G. Zind et D. Zéghal
"On the Demand for Historical Events Recording and Maintenance of Audit Trails" A. H. Amershi and P. Cheng
"Specialized Knowledge and its Communication in Auditing" P. Danos, J. W. Eichenseher and D. L. Holt
"Discussion of Specialized Knowledge and Its Communication in Auditing" D. A. Leslie
"Discussion of Specialized Knowledge and Its Communication in Auditing" D. A. Simunic
"The Acquisition Value of Oil and Gas Firms: The Role of Historical Costs, Reserve Recognition Accounting, and Analysts' Appraisals" D. Ghicas and V. Pastena
"A Classification of Mergers and Acquisitions by Motives: Analysis of Market Responses" R. Amit, J. Livnat and P. Zarowin
"On the Observability of Ownership Retention by Entrepreneurs With Private Information in the Market for New Issues" R. Conroy and J. S. Hughes
"Earnings News and the Firm Size Effect" B. T. Ro
"An Empirical Study of Regression Analysis as an Analytical Procedure" A. C. Wilson and D. Hudson
"Auditing Quality, Signaling, and Underwriting Contracts" J. Bachar
"Trading Volume Theories and Their Implications for Empirical Information Content Studies" H. J. Jang and B. T. Ro
"Discussion of Trading Volume Theories and Their Implications for Empirical Information Content Studies" J. A. Ohlson
"Discussion of Trading Volume Theories and Their Implications for Empirical Information Content Studies" R. E. Verrecchia

Book Reviews/Compte rendu de livres
Editor/Rédacteur: Daniel B. Thornton
W. P. Albo and A. R. Henderson, Mergers and Acquisitions of Privately Held Businesses W. D. Rotenberg
R. Capettini and D. Clancy (eds.), Accounting, Robotics and the New Manufacturing Environment D. L. Losell and A. R. Reuber
D. Simunic and M. Stein, Product Differentiation in Auditing: Auditor Choice in the Market for Unseasoned New Issues W. Smieliauskas

Manuscripts Accepted for Future Publication

Accounting and Business Research, Vol. 20, No. 78, pp. 143-151, 1990

The Diagnosis and Resolution of Emerging Issues in Corporate Disclosure Practices

R. S. O. Wallace and T. E. Cooke*

Abstract—This paper calls the attention of the accounting profession in the UK to a central but neglected process in accounting regulation, i.e. emerging issue diagnosis (EID). A framework for discussing EID is presented in terms of three critical components: inputs, resolution characteristics and outputs. The United States model, which may be influential for future corporate reporting in the UK, is discussed. In addition, consideration is given to a UK example—the City Code on Take-overs and Mergers—of the resolution of emerging issues.

> There is no formal mechanism for dealing quickly and effectively with newly emerging issues which are, therefore, resolved by practitioners on an *ad hoc* basis, not always with great consistency. Once an interpretation has been adopted, and especially if it is perceived to give an advantage in commercial terms, there is pressure on others to follow suit. It has been suggested that the limitations of an *ad hoc* approach or of informal arrangements could be avoided by the provision of a capability to give authoritative public guidance on new issues, and we were impressed by the arrangements that have been made in the United States through an Emerging Issues Task Force.
>
> *Dearing Committee Report* (1988), p. 10

The above quotation from the recent report of the Accounting Standard-Setting Process Review Committee set up by the Consultative Committee of Accountancy Bodies (CCAB) under the Chairmanship of Sir Ron Dearing CB (henceforth the Dearing Report) draws attention to the need for an Emerging Issues Task Force in the UK for resolving, on an authoritative and timely basis, emerging issues in corporate reporting. This paper critically examines the cases for and against such a proposal and concludes that the existing arrangement in the UK and other recommendations within the Dearing Report may be more adequate for resolving emerging issues without a formal framework.

Over the last decade there has been an increase in the number of standards with the aim of improving corporate disclosure. However, this growth has been matched by an increase in the propensity of company accountants and counsel—with a certain amount of passive approval from auditors—to circumvent the regulatory environment. Such efforts have been discussed by Griffiths (1986).

With all this activity, it seems appropriate to delineate how corporate disclosure regulators and accounting practitioners can (and do) diagnose and resolve emerging issues. To do so can aid not only those who have to deal with emerging issues in the financial statements they prepare, use or audit by providing a common language and set of guidelines for action, but also researchers and scholars by suggesting additional topics for investigation and linkage with other corporate disclosure topics on their agenda.

The concept 'emerging issues' suggests that three stages (emergence, maturity and decline) can be distinguished in the evolution of an accounting issue. Such an evolution is the result of specific environmental characteristics and it is difficult to predict the future of an emerging issue, unless one can predict the evolution of the environmental characteristics. In this sense, this evolutionary process is different from the well-known life cycle theory.

The purpose of this paper is to delineate the nature of emerging issues diagnosis (EID) in terms of its scope, importance and dominant characteristics and, in so doing, to establish its relevance to corporate disclosure regulation and practices and to provide a framework for resolving emerging issues.

The first section of the paper defines EID and illustrates its importance to the accounting standard-setting process and disclosure practices. Next, a model of EID is presented in terms of three components: inputs, resolution characteristics and outputs. The prevalence, significance and dimensions of EID are then illustrated in the context of recent reporting practices. This is followed by a description of the arrangement for dealing with emerging issues in the context both of take-overs and mergers in the UK and also of how such accounting issues are considered in the United States. Finally, a number of implications for corporate disclosure regulators, auditors, theorists and preparers of annual reports are noted.

---

*The authors are, respectively, lecturer and senior lecturer in accountancy at the University of Exeter. They acknowledge the helpful comments of two anonymous reviewers.

EID: its meaning and importance

What Is EID?

The Dearing Report does not define an emerging issue but suggests that 'a feature of recent years, with the growing complexity of commercial life, has been the frequency with which difficult new issues arise'. For the purpose of this paper, EID refers to the process by which emerging issues are identified and then analysed. The term 'emerging' refers to accounting and disclosure patterns which do not form part of generally accepted accounting principles and practices (GAAP). The term 'issues' covers commercial events and transactions, novel interpretations of existing accounting standards and rules. In short, emerging issues are new accounting and disclosure problems arising from newly formed events or transactions, or interpretations of accounting standards and rules.

An emerging issue may be said to have three 'seeds': idea, event and action. A seed idea arises when a person or organisation develops a potentially innovative financial disclosure practice. Talks, lectures and publications by senior partners of leading accountancy firms tend to sow idea seeds. A seed event refers to a new commercial event or transaction which would most probably create a problem for corporate financial reporting. Such events include new business transactions and new tax laws for which there is no accounting standard or rule. They create a need for the development of accounting and corporate reporting procedures. The first report of such an event or transaction in an enterprise's annual report can be described as a seed action. A seed action is the first sign of an emerging accounting issue. The action serves as a trigger for the generation of alternative ways of reporting a seed event as it may constrain the development of better ways, especially if the organisation which provides such a seed action is judged by those who have to disclose such events in the future as the 'lead' organisation in corporate disclosure terms.

An example may highlight the nature of these three seeds. Consider a purchase which creates an intangible asset in the balance sheet. Let us assume that there is a requirement to write off intangible assets either immediately to reserves or to amortise such assets over their useful lives. An individual suggests that to avoid the adverse consequences to realised profits or reserves it would be advantageous to create a negative goodwill reserve (see, for example, the accounts of the Erskine House Group for the year ended 31 March 1986). The general idea can then be made specific by application to a relevant event or transaction. Such an event may be the acquisition of another company. The application of the idea to a particular event leads to corporate reporting consequences. Such application creates financial disclosure innovation which may have implications for corporate financial disclosure.

The Importance of EID

Not only are emerging issues likely to affect financial disclosure and regulation but they also have an impact on the behaviour of auditors. One problem is that '... companies are increasingly prepared to challenge auditors, to shop around for opinions, to seek counsel's opinions on the auditors' views and to change auditors' (Dearing Report, 1988, p. 11) probably because of their concern to maintain or enhance share prices or to guard against or launch takeovers.

The problems created for accounting regulation and professional practice by emerging issues suggest that there could be a role for some sort of framework for understanding how such issues may be diagnosed and resolved. Such a framework is summarised in Figure 1 and considered next.

Input characteristics of an EID framework

The process whereby an emerging issue is transformed from an idea to a corporate disclosure item depends upon three main factors: assumptions and beliefs, political and economic interests and the type of emerging issue.

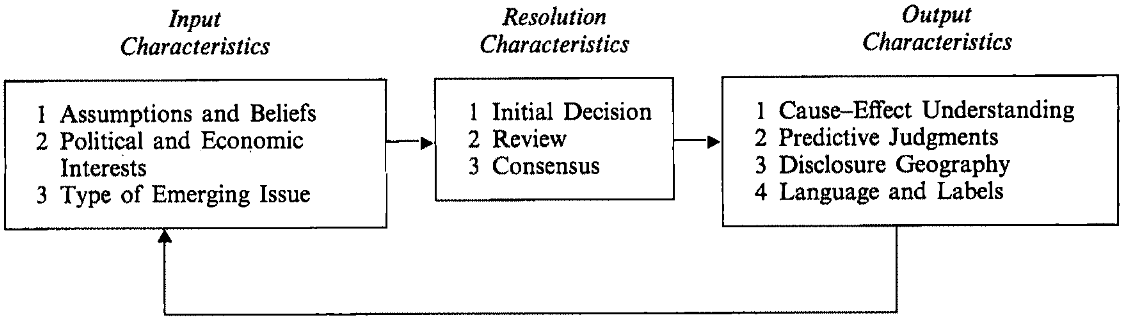
Assumptions and Beliefs

The extent to which assumptions have to be made about an accounting issue depends in part on the level of available information and the complexity of the emerging issue. The greater the complexity of an issue and the lack of information the more the need to make assumptions.

Three implications of these assumptions are especially important. First, assumptions act as an uncertainty absorption mechanism because of the nature and complexity of an issue. Second, in analysing emerging issues, questions should be raised concerning underlying assumptions, their reasonableness, relevance and consequences. Third, assumptions may influence not only our perceptions of the issues but also the range of alternatives and how they influence information collection and interpretation.

Beliefs, particularly those related to concepts, held by individuals such as corporate managers and practitioners are an important element of the seed idea phase. They play an important part in the resolution process because of the multivariate nature of beliefs held by reporting enterprises, auditors and accounting regulators. Beliefs can be compromised because of political and economic interests.

Figure 1
Emerging Issue Diagnostic Framework



Political and Economic Interests

Emerging issues provide subjects of public interest and constitute the force by which the concerns of individual participants are expressed, accounting policy precedents are established, organisational resources are allocated and the environment is shaped by accounting. Often it is the case that attempts are made to influence the issue resolution process to suit a particular vested interest. These attempts are manifested in opinion-shopping by reporting enterprises (reported by the Dearing Committee). Watts and Zimmerman (1978) suggest that management compensation, information production costs, regulation, taxes, and political costs are factors that influence organisational management to lobby on accounting issues.

The audit profession is also enmeshed in the network of opposing interests. Auditors are involved with three polarities bearing on the emerging issues resolution process. The first relates to the market for auditing services. This competitive market creates a conflict between the auditors' pursuit of professional competence and their drive for commercial profit. There is the danger that auditors could innocently or deliberately lobby to protect the interests of the majority or most influential of their clients (and, indirectly, their audit fees). It would be idealistic to assume that all auditors at all times are unmindful of the risk of losing business (Dearing Report, 1988, p. 11). It is important to note that professional accountancy firms in the UK are collections of partners whose objective is the pursuit of profit. Consequently, there are political pressures within a firm—between individual partners—and between firms. A firm's view on any particular issue may represent a consensus of individual views or may depend on the balance of power between those holding different views at different ends of the commercial-professional continuum. Auditors' quests for commercial profit could clash with their professional duty to protect the integrity of financial reporting and to ensure that the 'best' accounting principles and methods are adopted (MacArthur, 1988, p. 58). This professionalism/commercialism conflict makes the role of the audit profession in the emerging issue process onerous. The competitive audit services environment provides a forum for corporate accountants to 'shop' around for accountancy ideas and for auditors to compete on the basis of the accounting ideas which are most beneficial to their clients. Confidence in the accountancy profession is reduced and society is not well served if two or more accounting firms arrive at significantly different opinions on the basis of the same set of facts or events (Estes and Reames, 1988). The banks are also in the game, since it is they who design financial instruments (e.g. to make possible off-balance sheet transactions) to exploit loopholes in accounting regulations and standards. Professionalism requires an auditor to recommend an accounting answer that best depicts the economic facts of a transaction, but commercialism may make the auditor condone any accounting idea a client wants provided it does not violate an explicit accounting standard.

The second polarity concerns the big vs. small audit firm. The competitive audit environment is hostile to the small audit firm. It is characterised by precarious commercial settings: intense competition; harsh, overwhelming business climates; and complex professional knowledge of new and ever-changing data-processing technologies, increasing tax laws and other government regulations and a growing body of accounting standards. The adverse impact of environmental hostility probably presents an even greater threat to small audit firms due to their limited resource and client bases and their relative inabilities to survive the consequences of poor managerial decisions.

The third polarity concerns the location of emerging issues along the continuum of self-regulation and government control of accounting rules. If emerging issues are not attended to by the accountancy profession, they may develop into financial crises and scandals.

The Type of Emerging Issue

The third factor by which an emerging issue is transformed into a corporate disclosure item depends upon the type of emerging issue because of the implication for the search for information. Where information on a particular issue is low it is likely that the consequent uncertainty would influence interested parties towards the search for information (Jonsson, 1988) rather than the short-term resolution of the problem. Individual motivation would be affected by the intensity of the need to resolve the issue.

Resolution characteristics of an EID framework

Resolution is the next phase of our emerging issue diagnostic framework. Whilst the resolution phase is likely to be complex three key characteristics are worthy of further consideration.

The initial decision phase involves a consideration and interpretation of the issues and possible disclosure procedures by management in the light of consultation with auditors and, more recently, legal counsel. Thus, the search here suggests that management are prepared to adjust or manipulate corporate reports in support of their strategies and goals subject to whatever statutory constraints exist (Standish, 1970, p. 4). The interaction between corporate management, auditors and an 'independent' agency which may be responsible for resolving emerging issues is summarised in Figure 2. Such a framework is adapted from the framework of Ashton *et al.* (1988, pp. 104–5) for a typical medical diagnostic problem. This framework is useful in understanding the second resolution characteristic which involves a review of the consequences of an accounting innovation. This characteristic involves a process whereby information is focussed and filtered leading to a decision as to the appropriate concepts that should be adopted by the organisation.

The third resolution characteristic is that of consensus reflecting the susceptibility of EID to the actions of individual participants. The process is similar to game theoretic situations, involving a set of actors (players) with political interests (utilities) playing to get their interpretations (outcomes) accepted. Disagreements may well persist which may influence any subsequent reconsiderations.

Output characteristics of an EID framework

The input and resolution processes of EID are not ends in themselves; it is the output that matters. At least four types of issue-specific outputs can be identified. Two of these outputs are related to the content of an emerging issue: (a) cause-effect understandings and (b) predictive judgements. The remaining two are perhaps symbolic in nature: disclosure geography, and language and labels. These outputs occur at both the organisational and collective levels. At the former level, each organisation involved in EID produces some type of understanding of an issue which is reflected in these outputs. However, interactions with other organisations on the resolution of a particular issue may also be viewed at a collective level.

Cause-effect Understandings

When resolving an emerging issue, organisations generate understandings that link the event with the concepts in a causal manner. For example, understandings about the causes of a new commercial event may help in deciding on its importance and urgency. These cause-effect understandings may affect subsequent interpretation and actions.

Predictive Judgements

Assumptions and cause-effect understandings lead to the formation of predictive judgements. Such a judgement involves an assessment as to the future concerning a particular issue and may include the timing of events, their magnitude and the implications of a particular issue.

Disclosure Geography

The idea of disclosure geography was suggested by Beaver (1973) and refers to the surface (not deep) meaning of the contents of accounting reports (Thornton, 1988). It describes the location of the disclosure item relating to an event within the financial report—whether in the body of a financial statement or as notes to that statement. For example, Thornton (1988) argued that it does not matter whether the present value of a lease obligation is shown as a liability on the balance sheet or described in footnotes; the meaning should be the same. But one would also agree with the doubt he expressed in a footnote on whether people react (on a pragmatic level) identically to balance sheet and footnote disclosure.

Disclosure can also be made in other sections of the corporate report; such as the directors' report, employee section, chairman's statement and supplementary statements.

Language and Labels

The use of language and the assignment of labels reflect the understandings of an emerging issue from the perspective of EID participants. In addition, labels can serve to communicate understandings with other elements of society. Such understandings may try to mobilise views in a particular direction. This view agrees with Belkaoui's (1978) suggestion that accounting, like language, provides concepts and frameworks that structure thought, conversations, perceptions and decision making. For example, the labelling of attempts to construct off-balance events and to circumvent accounting rules and standards as 'creative accounting' is a deliberate linguistic manipulation to rally support for its correction. Some view the term 'creative accounting' as a euphemism for 'cooking the books'.

The resolution of emerging issues in the UK and US

This section deals with the arrangements for dealing with emerging issues. One of the problems in the UK is that there is no institutional mechanism[1] for dealing with emerging accounting issues. This point is recognised by the Dearing Committee (p. 29):

> A feature of recent years, with the growing complexity of commercial life, has been the frequency with which difficult new issues arise; the evidence we have received points to the desirability of expert guidance being available from an authoritative source. The normal procedures for the development of full accounting standards, while necessary to ensure that every aspect has been fully explored in depth, are too slow to meet the immediate need for guidance.

The UK has witnessed a growing tendency to circumvent standards by procedures which account for the form of a transaction rather than its economic substance. Schemes have been developed to raise finance outside the balance sheet such as through the use of controlled non-subsidiary companies. One specific way of circumventing a particular accounting standard has been the increase in the number of operating lease contracts written since the introduction of SSAP 21, Accounting for leases and hire purchase contracts, which was issued in August 1984. Such procedures are often supported by legal opinion, perhaps not surprisingly since it extends the sphere of influence of the legal profession.

A pragmatic approach by some companies to emerging issues in the UK has been to seek the support of an auditor—particularly one of the 'big eight'—in order to create a precedent. Audit firms then come under intense pressure to accede or face the possibility of a lost client. Commercial pressures are such that corporate accountants are able to overcome the potential unity of major international accountancy practices.

Whilst the UK does not have a formal mechanism for responding quickly to emerging accounting issues, the City Code on Take-overs and Mergers represents an example of how such issues are dealt with in the context of take-overs. This example may offer some guidance to, and perhaps replication of, the resolution of emerging issues in the accounting arena.

A second example is used to summarise the arrangements for the resolution of emerging issues in the US. The lack of apparent guidance in the UK led the Dearing Committee (p. 29) to '... recommend that the Accounting Standards Board should establish a capability of high standing to respond to this need and we recommend for their consideration the arrangements that have been made in the United States'.

The City Code on Take-overs and Mergers (the Code)

The Panel on Take-overs and Mergers was set up in 1986 on the initiative of the Governor of the Bank of England. The aim of this initiative was, and still is, to exercise control over listed companies involved in the acquisition of substantial shareholdings. What is now referred to as 'the Code' is issued and administered by the Panel on Take-overs and Mergers. The Code tries to ensure that all shareholders are treated fairly and equally in relation to take-overs. The Code provides an 'orderly framework within which take-overs are conducted.... The Code represents the collective opinion of those professionally involved in the field of take-overs as to good business standards and as to how fairness to shareholders can be achieved. The collective opinion is expressed through the wide representation of interests on the Panel. The representative bodies co-operate through the Panel because of the importance of the maintenance of such standards to the integrity of the financial markets in the United Kingdom' (the Code, Section A1).

The Code is not backed by law, and indeed many of its provisions could not be converted easily into statute. Instead, the Code is backed by an understanding that if it is not observed, the facilities of the securities market in the UK may be withdrawn from an offending company.

The Code is divided into two elements. First, general principles of good business practice and behaviour are laid down. Second, the Code lays down specific rules, some of which '... are no more than examples of application of the General Principles and the panel seeks to interpret them in accordance with those Principles. Others are rules of procedure designed to govern specific types of take-over. Accordingly, the Code, through the General Principles, may modify or relax the application of a Rule in exceptional circumstances, for example, when it considers that its strict application would operate unduly harshly. The provisions of the Code would not easily lend themselves to legislation and so the Code is framed as far as possible in non-technical language'.

---

[1] The Technical Committee of the ICAEW has recently (May 1989) prepared a confidential draft of a paper on emerging issues in accounting. This document does not seek to develop a framework but represents a summary of key emerging issues—including acquisitions; fair value; goodwill; interest rate swaps; lease classification; merger relief; off balance sheet financing; and research and development. The aim of the ICAEW's paper is to identify '... topics from Company law and SSAPs where commentators have claimed that requirements are not clear or that further guidance is needed'. The topics are of fundamental importance to corporate reporting and not merely esoteric.

The most important feature of the Code is that it is able to react quickly to reflect changes in market conditions by Panel decisions (Cooke, 1986, p. 76). The essence of its success is its ability to react quickly to emerging issues. Where there is any doubt as to whether a proposed resolution of an emerging issue is in accordance with the general principles or rules, parties or their advisers are advised to consult the executive, which is

Figure 2
Framework for Emerging Issues Resolution

Process	*Organisational Diagnostic Framework*	*Collective Diagnostic Framework*
Issues definition	The company discovers it needs a new accounting procedure to deal with a new issue. It classifies the issue on the basis of whether it relates to a seed event, or a new interpretation of an accounting standard.	The auditor or finance director of the reporting company informs the 'Agency' responsible for resolving emerging issues about the seed event and the need for an accounting innovation.
Internal acquisition of information	The company searches through its own organisational culture and procedures to determine what it knows about such an event and how to approach it in its annual report.	The Agency searches through its own records and brainstorms its own staff to determine what it knows about such an event, the persons and organisations with political and economic interest in the resolution of such issue, and how to approach it in corporate reporting terms—what to report, how to report, or what and how to value or measure.
External information acquisition	The company scouts for opinions from its auditors, solicitors and counsel.	The Agency gathers information about the issue (i.e., asks the originating enterprise questions), conducts a survey of other enterprises and seeks opinions on how to resolve the accounting disclosure problem.
Output	The processed evidence results in a judgement: in this case a diagnosis of the accounting problem.	
Action	After consideration of the diagnosis, the political and economic interests of participants and the consequences of different solution options, a decision is made; the company or the Agency acts upon it (e.g. prescribes an accounting or disclosure procedure by the issue of a Technical Bulletin or the incorporation of the issue in the agenda for an accounting standard).	
Outcome	The accounting idea suggested may be acceptable to other enterprises or may provoke reactions from shareholders, accounting regulators, the DTI, Stock Exchange and employees.	The combined results of the Agency's action and the needs of the target groups may mean that the accounting procedure is taken as a generally accepted accounting practice.
Feedback	A revised accounting treatment in subsequent annual reports may be considered necessary.	The observed or communicated reaction to phases of the decision process (e.g. complaints and tensions of dissatisfaction from interested constituencies) may signal a need for reconsideration.

responsible for the general administration of the Code, in advance. Such a procedure ensures that a proposed resolution to an emerging issue would not breach the Code.

Emerging Issues Task Force in the United States

The FASB's Emerging Issues Task Force (EITF) was formed in 1984 to (a) diagnose emerging accounting issues and implementation problems, (b) provide timely guidance on their resolution, and (c) 'limit the number of issues requiring formal pronouncements by the FASB' (Upton and Scott, 1988). The 15 members of the EITF exclude academic accountants but include the top technical partners of eight large accounting firms, three representatives from relatively small CPA firms and representatives of major associations of preparers of financial statements such as the Financial Executive Institute, the Business Roundtable, and the National Association of Accountants. The chief accountant of the SEC and the Chairman of the AICPA's Accounting Standards Executive Committee (AcSEC) take an active part in the deliberations as observers. Representatives of other interested organisations are invited to attend the meetings of the task force on an *ad hoc* basis when topics of concern to them are discussed. The meetings of the task force are open to public observation and provide a forum in which task force members can raise issues, discuss factual situations and consider what accounting and reporting method should apply. The EITF meets every six weeks under the chairmanship of the FASB's Director of Research and Technical Activities to deal with troublesome issues of current interest and to advise the FASB on what, if any, action it should take (FASB, 1988).

The agendas for all task force meetings are published in 'Action Alert'. Issue summary packages, comprising a one-page form summarising essential points and related attachments, serve as a basis for discussions of the task force. The packages are prepared by individual EITF members or by members of the FASB staff. Most issue summary packages attempt to provide a neutral discussion, although some packages advocate a particular accounting treatment. In either case, the views expressed in an issue summary package represent the views of the preparer prior to discussion of the issues by the Task Force.

EITF seeks to evolve a consensus of the best solutions to practice problems. Consensus in the context of EITF means that not more than two members have disagreed with a position. The SEC Observer expects an EITF consensus to set the tone for future accounting and expects to question any SEC registrants' accounting practices that differ from an EITF consensus because the EITF resolution process provides the opportunity for the SEC to seek advice in a public forum. The Chairman and some members of the EITF have expressed reservations about attaching undue weight to an EITF consensus because members do not usually spend enough time in the resolution of the issues (FASB, 1988, p. 4953). The EITF is not intended to be an accounting standard setting body; its purpose is to diagnose emerging accounting issues and advise the FASB staff on whether the issues require FASB action. If consensus evolves because accounting for a particular transaction or issue is clear or a particular new transaction or issue is analogous to a transaction or issue for which the accounting is clear, there would be no need for an FASB action (FASB, 1988).

Although the FASB seems to be responsible for taking on board issues on which consensus has been reached and recommendations have been made by the EITF, it appears in practice that three institutions seem to include in their agenda the implementation of some issues with EITF consensus. These are (i) the FASB, which includes an EITF consensus in its technical bulletins; such an inclusion enhances the retrievability of an accounting position but it also leads to the appearance that there are two EITF consensuses—those endorsed by the FASB and those not so endorsed; (ii) the AICPA which includes details relating to some EITF consensuses in its 'Notice to Practitioners and Practice Bulletin'—this method gives an EITF consensus the status of a guidance: (iii) the SEC which issues Staff Accounting Bulletins (SABs) to guide the corporate reporting of registrants and EITF consensuses are included in such SABs.

The Case for EITF in the UK

The EITF is probably useful because it is capable, as its five-year experience in the US seems to suggest, of dealing with troublesome issues of current interest. It would serve as a screening device, advising the standard setting body of difficult issues for inclusion on its agenda. It is also a forum for developing a consensus of the 'best' accounting option. The most important role it seems to serve is to remove the settlement of emerging accounting issues from the market for accounting opinions. Although the supply of accounting opinions is fuelled by the commercial fires of auditing firms trying to increase their market share, it is also fed by the demand for such opinions by those preparers who desire a competitive edge through reporting better earnings (or less debt). Another advantage is that an EITF can evolve a consensus on a timely basis, and thus probably make auditing firms more resistant to the commercial temptation of opinion shopping and loopholing requests of clients. This may indicate to the clients of the auditing profession that abusive practices will not be tolerated. It is likely to reduce or stop divergent practices and protect the auditors from their clients and the law, and most probably reduce the demand for more accounting standards.

The ultimate fate of an EITF consensus in the US depends largely upon the approval of the SEC's chief accountant for an innovative accounting idea to appear in a corporate report. Although it is not intended, an EITF consensus may become *de facto* a mandatory standard. As noted above, the SEC's chief accountant has indicated that the SEC will question registrants' accounting practices that differ from an EITF consensus. So, for companies listed on American stock exchanges at least, an EITF consensus could effectively establish mandatory accounting standards.

The Case against EITF in the UK

In the UK, the ultimate fate of an innovative accounting idea depends largely upon auditor-auditee collaboration to initiate new changes within the framework of the Companies Acts and, if applicable, the requirements of the Stock Exchange. However, there is no corresponding official in the UK with the powers of the Chief Accountant of the SEC in the US. This raises some doubt as to the validity of the Dearing proposal to transplant the US EITF model to the UK.

The current fluid practice of resolving emerging issues seems adequate when viewed in the context of other proposals by Dearing. In the UK, emerging issues resolution is an ongoing, communicative, interactive and participative political activity consisting of various components such as institutional arrangements, their orientations, authority structures and roles. It involves an analysis of initiation, development and decision concerning an accounting solution to new events, transactions and reinterpretations of existing rules. It is an ongoing activity because the pursuit of improved corporate financial reporting is an unending one; regardless of how much progress accountants make there will always be a need to fulfil new environmental and social demands for information. It is a communicative, interactive and participative political activity in the sense that those who prepare, audit, use, regulate and advise on the contents of corporate annual reports have equal opportunity to voice their views and needs for a new accounting idea. It is essential that whatever solution is evolved is suited to the needs of society and reporting companies especially. This is one aspect of accounting practice which demands close collaboration between the accounting profession and the society. It is this collaboration which will constitute the emerging issue resolution process in which individuals and institutions act, interact and react to reject or retain new accounting ideas as 'GAAP'. An EITF procedure will stifle such a process and exclude some important parties from the resolution process. The current practice in the UK reflects a non-uniform environment which abhors uniformity and in which the differing rights of reporting organisations, their auditors and counsel are so entrenched that any attempt to stop it may prove difficult to attain. This flexibility or freedom to choose accounting options probably 'works well and leaves honest men tolerably free to think and experiment. It provides a floor, not a ceiling' (Baxter, 1953).

The due process through which an accounting idea passes to become an accounting rule or convention encourages initiative and variety and includes (a) an experiment by a company wishing to establish itself as a leader; (b) the adoption of the new development by other companies; (c) confirmation by a pronouncement by the Department of Trade and Industry or the Stock Exchange (or in court, for example in the Netherlands, or by the proposed Review Panel for the UK), if the issue comes up in a case; (d) if the accounting idea refers to an interpretation of an accounting standard, the issue of a technical release and if the idea refers to an important new issue, the inclusion of the idea as a preferred or recommended practice in an accounting standard on the issue, and (e) establishment in company law as a statutory requirement.

Much of the work undertaken by the EITF, as organised in the US, has been allocated by Dearing to other institutions proposed for the UK. One such institution is the Financial Reports Review Panel. The Review Panel would examine and rule on contentious departures, by large companies, from accounting standards which involve an issue of principle or which might result in the accounts not giving a true and fair view (p. 32). It is suggested that a failure to comply with the ruling of the Review Panel should lead to prosecution and eventual de-listing of the erring company (p. 33). Under this approach, such rulings would, over time, become reference points from which reporting companies would draw when they had to deal with seemingly similar situations.

Another recommendation that would reduce the need for some of the duties which EITF undertakes in the US is the readiness of the staff of the proposed Accounting Standards Board (ASB) to give guidance on the interpretation of an accounting standard when there is a clear basis for the advice.

Another reason why the EITF may not be needed in the UK is the proposal suggested, by Exposure Draft (ED) 42, Accounting for Special Purpose Transactions, for the resolution of some substantial new issues by reporting companies. ED 42 seeks to provide a basis for 'determining the correct method of accounting for types of complex transactions whose true intention and commercial effect may not be immediately obvious but which significantly affect the financial position and prospects of the reporting enterprise' (para. 1.1).

Such a proposal is not available in the US and was most probably ignored by the Dearing Committee.

If the EITF is not introduced in the UK, how can opinion shopping be dealt with? The EITF seeks to take over from individual auditing firms and legal counsel the task of giving opinions, probably on the basis of a belief that the present arrangement dilutes the market for accounting opinions. It is possible that the fault lies with the laxity in professional ethics. In this case, opinion shopping and loopholing can be curbed if the accountancy profession seeks to increase the professionalism of its members so as to lessen the temptation of auditors to respond to demands from (a) non-clients for selfserving opinions and (b) clients for loopholing. Auditing firms should endeavour to respect the territories of their competitors and avoid the use of unethical practices such as low-balling, loopholing, and the offer of unacceptable accounting opinions as a basis for increasing their market shares.

Conclusions

Emerging issues are accounting and disclosure issues related to new or different types of events or transactions. The role of the EITF in the US is to diagnose and reach a consensus on the resolution of such issues not to identify them.

An implicit assumption in this paper is that emerging issues for diagnosis and resolution will flow voluntarily and continuously from people who audit, use, prepare or regulate financial reports to the agencies responsible for their resolution. But how can one be sure that such issues will be available regularly? There are four possibilities: (a) the proposed financial statements review panel, the Department of Trade and Industry and the Stock Exchange may direct the attention of the relevant agency to accounting seed actions found in corporate annual reports; (b) auditors coming in contact with seed transactions and events for which new accounting solutions are needed may prepare an issue paper for submission to the relevant agency; (c) financial institutions devising new financial instruments may direct the attention of the relevant agency to such instruments and their accounting implications; and (d) the relevant agency may develop a capability for scanning the environment for seed events and ideas.

An integrative framework has been suggested in this paper for understanding the diagnostic and resolution components of emerging issues. The resolution of an issue is determined by the way the issue is diagnosed. The major implication of these observations for scholars and practitioners is that a full appreciation of EID is required to understand how to resolve emerging issues.

References

Accounting Standards Committee (UK) (1988), *The Making of Accounting Standards*: Report of the Review Committee under the Chairmanship of Sir Ron Dearing CB (the Institute of Chartered Accountants in England and Wales).

Ashton, R. H., Kleinmuntz, D. N., Sultiva, J. B. and Tomassini, L. A. (1988), 'Audit Decision Making', in *Research Opportunities in Auditing*, A. R. Abdel-Khalik and I. Solomon (eds) (AAA, Auditing Section, Sarasota), pp. 95–132.

Baxter, W. T. (1953), 'Need for A Reevaluation of Accounting Theory', *Accountant*, October 10.

Belkaoui, A. (1978), 'Linguistic Relativity in Accounting', *Accounting, Organizations and Society*, Vol. 3, No. 1, pp. 97–104.

Beaver, W. H., (1973), 'What Should Be the FASB's Objectives?', *Journal of Accountancy*, August, pp. 49–56.

Cooke, T. E. (1986), *Mergers and Acquisitions* (Basil Blackwell, Oxford).

Estes, R. and Reames, D. D. (1988), 'Effects of Personal Characteristics on Materiality Decision: A Multivariate Analysis', *Accounting and Business Research*, Autumn, pp. 291–96.

FASB (1988), *EITF Abstracts*: A Summary of Proceedings of the FASB Emerging Issues Task Force (Financial Accounting Standards Board, Connecticut).

Griffiths, I. (1986), *Creative Accounting* (Sidgwick & Jackson, London).

Jonsson, S. (1988), *The Elite and the Norms: Driving Forces in the Development of Accounting Policy* (John Wiley, Chichester).

MacArthur, J. B. (1988), 'Some Implications of Auditor and Client Lobbying Activities: A Comparative Analysis', *Accounting and Business Research*, Winter, pp. 56–64.

Standish, M. E. (1970), 'Company Financial Reporting: Communication or Mystification', *Chartered Accountant in Australia*, May, pp. 4–9.

Thornton, D. B. (1988), 'Theory and Metaphor in Accounting', *Accounting Horizons*, December, pp. 1–9.

Upton, W. S. and Scott, D. K. (1988), 'What You Should Know About the EITF', *Journal of Accountancy*, June, pp. 56–62.

Watts, R. and Zimmerman, J. (1978), 'Towards a Positive Theory of the Determination of Accounting Standards', *Accounting Review*, January, pp. 112–34.

THE ACCOUNTING HISTORIANS JOURNAL

Semiannual Publication of The Academy of Accounting Historians

Volume 16, Number 1 *June 1989*

CONTENTS

Main Articles

Canada's Accounting Elite: 1880–1930—Alan J. Richardson

Legislative History of the Allowance of LIFO for Tax Purposes—Morton Pincus

The Standardization of Mine Accounting—Glenn Vent and Ronald A. Milne

Accounting "Revolutions" in Japan—Kyojiro Someya

The Life of Bartolomé Salvador de Solórzano: Some Further Evidence—
Esteban Hernández Esteve

A Note: Graves, Sweeney and *Goldmarkbilanz*—Whither Sweeney and
Schmidt's *Tageswertbilanz*?—Graeme Dean and Frank L. Clarke

H. K. Hathaway on Product Costing: Relevant Issues of Contemporary
Concern—Robert A. Seay and Roger C. Schoenfeldt

Accounting and Business Research, Vol. 20, No. 78, pp. 153–166, 1990

Managing It All By numbers: A Review of Johnson & Kaplan's 'Relevance Lost'

Mahmoud Ezzamel, Keith Hoskin and Richard Macve*

Abstract—This review article sets out the Johnson and Kaplan diagnosis of the 'problem' with modern US cost accounting and management control systems ('MAS') and challenges both their historical analysis and their proposed remedy. It traces the genesis of the knowledge-based disciplinary power of managerialism from the 1830s in the US and contrasts the development of the US/UK focus of MAS on 'managing by the numbers', with the different way that knowledge-power has been used by, and has interacted with, managerialism in Japan. It argues that the problems to be confronted with MAS are inherent in the historical genesis of such systems and that it is the behavioural limitations in the way organisations deploy MAS that most need attention. In addition the interrelationships of control between the accounting measurements that create visibility within and without the organisation require that greater attention be addressed to the technical limitations of financial accounting. In conclusion it is suggested that the differing alignments of knowledge-based expertise and disciplinary practices of management control that have developed in the US/UK and in Japan reflect deeper differences in their cultural history.

Introduction

Johnson & Kaplan's *Relevance Lost* (1987) has deservedly been greeted as one of the most significant monographs on the history of accounting published to date. The major theme they address is the process by which cost accounting and management control systems (henceforth generally abbreviated to 'management accounting systems' or 'MAS') have developed to the stage where senior executives believe they can 'run their firms "by the numbers" ' (p. 15). Johnson & Kaplan (henceforth 'J&K') set out a powerful thesis which emphasises the importance of understanding accounting history and which parallels the work of Alfred Chandler for US business history more generally. But we do not wholly accept either that history or their interpretation of it. They see 'managing by the numbers' as a perversion of the original and proper role and nature of MAS; we see it as inherent in the early nineteenth century genesis of MAS—and correspondingly we see a different history of its development. J&K propose remedies: a return to late nineteenth century principles of cost management, independent of financial accounting concerns, and a 'Japanese style' approach to production control. We question the efficacy of either of these remedies for the US or UK, and focus on the need for further understanding of the ways in which human performance in organisations interrelates with the manner in which that performance is measured, both internally through MAS and externally through financial accounting.

Business is often keen to stress that it is the 'real world'. So today it is. But that 'real world' had to be invented: it did not happen automatically or inevitably. Its invention took place, we suggest, primarily in the US in the decade between 1832 and 1842, and consisted in developing key disciplinary practices (disciplinary in the sense of being both practices of power and based in expert knowledge) which for the first time made it possible to manage by the numbers. Once invented those practices proved so powerful, in real economic terms, that the world became business's modern 'real world' (Hoskin & Macve, forthcoming).

We suggest in conclusion that the Western approach to 'managing by the numbers'—accountability based in financial measures of control—has become the most powerful form of control in US and increasingly in UK business organisations, and an increasingly pervasive form of control in many aspects of social organisation, because it is a necessary alternative to the more visible and physical forms of control that were used in the premodern world and remain acceptable in Japanese industry. The methods of 'managing by the numbers' have developed from techniques which have engendered the construction of a new kind of knowledge quite different from anything that preceded it: a knowledge that has enabled modern societies to regard individual performance as capable of objective measurement and to construct a new discourse of performance standards and deviations across a whole range of human behaviour.

---

*The authors are, respectively, professor of accounting at Aberystwyth University College, lecturer in accounting at Warwick Business School, and professor of accounting at Aberystwyth University College.

In Western business organisations this discourse of management by the numbers emphasises individual performance and responsibility more than group identity and group loyalty. In Japan control focuses primarily on the group, deploying an alternative alignment of management and accounting techniques and practices of power that appears in turn to reflect deeper characteristics of Japanese culture. Our paper is developed[1] as an extended review of J&K in four sections. In the first section we present an overview of J&K's own thesis; in the second, a critique of their history of the origins of cost accounting and MAS. The third section addresses the J&K 'remedies' and relates them to important behavioural aspects of organisational control and to the relationship between financial accounting and MAS. In the concluding section we present an alternative view of the roles of MAS in Western and Japanese cultures and of their historical development.

An overview of the Johnson and Kaplan thesis

The book contains eleven chapters. Chapter 1 is an introduction in which J&K set the scene for their argument by briefly referring to the challenge faced by contemporary organisations as a result of vigorous global competition, rapid progress in production technology, and wide fluctuations in exchange rates and prices of raw materials. They then identify MAS as a vital component of corporate strategy for achieving competitive success. They see in modern information technology an excellent opportunity to develop more accurate, more timely, and more effective MAS. They chart briefly the historical development of MAS along with developments in the nature of organisations and their requisite information over the last 150 years.

The remaining 10 chapters of the book divide broadly into three parts. The first part (chapters 2–5) offers a detailed historical analysis of the emergence and development of MAS from the middle of the nineteenth century until the 1920s and sets out much of the important work that has been done by scholars, including Johnson himself, in the last twenty years. The second part (chapters 6-9) traces the shift from cost management to cost accounting (focussing primarily on computing inventory cost for incorporation into financial accounts), the 'unsuccessful' attempts by academics to maintain the relevance of MAS, and what the authors view as the obsolescence of MAS in the 1980s, given the nature of the new global competition. The third part (chapters 10–11) explains the authors' recipes for improved MAS in the form of newly developed systems for process control and product costing, and performance measurement systems for the future. We only have space for a brief description of the main arguments contained in each part.

Organisational Characteristics and MAS Design

The analysis in the first part demonstrates how organisational characteristics and opportunities for gain affect the design of MAS. Although not explicitly introduced until a later chapter, the theoretical basis of the historical analysis is Williamson's (1970, 1975) 'transaction costs' theory of the relative advantages of internal coordination by management over external coordination by the market, based on Coase's (1937) theorem that 'a firm will grow until the marginal cost of discovering opportunities for gain within the firm exceeds the marginal cost of discovering opportunities for gain in the market' (J&K, p. 88). The textile mills, Carnegie's steel works, the railroads, and the distribution and urban retailing companies which developed in the US in the nineteenth century were all pre-occupied with how to attain gains by internalising various conversion processes for a single economic activity. As a consequence, emerging MAS focused on the evaluation of a company's internalised processes using accounting information for each type of company. Manufacturing firms focused on the costs of converting material across production stages (including factory overheads); railroad transportation firms emphasised the cost per ton-mile; and mass distribution firms used stockturn (inventory turnover). In addition to these three main summary statistics, numerous other detailed measures were developed. For example, in manufacturing firms cost per hour and cost per pound produced were calculated for each worker. Similarly, railroad transportation firms which developed the first business hierarchies where managers managed other salaried managers (p. 37) used the operating ratio (revenues/operating costs) to evaluate the performance of business segments and managers. Also, firms engaging in distribution activities used gross margin to assess departmental performance. A notable feature of this era is that the accounting was focussed on the efficiency of operations in utilising the capital investment that had been made: but not on the allocation of capital (so 'depreciation' was ignored).

Further developments in MAS occurred during the 'scientific management' era, where emphasis

---

[1] We are grateful for the constructive criticisms made on earlier versions of this paper by colleagues at Aberystwyth, in particular John Williams and Karel Williams of the Department of Economics and Agricultural Economics, and by participants in the Business History Conference: 'Accounting and Business Decision Making in Companies, 1844–1938' held at Cardiff Business School, 20–21 September 1989. Financial support from the ESRC (Ref: RF00232405) for some of the research cited here is also gratefully acknowledged.

centred first on improving the efficiency and utilisation of labour and materials by evolving physical standards for them. These physical standards were also converted into labour and material 'standard costs' which allowed investigation of 'variances' between standard and actual for management control purposes. As in the case of conversion measures developed earlier, emphasis during that era was on cost management. Hence, MAS evolved independently of the principles governing the preparation of financial accounting (the use of standard costs for inventory valuation in financial accounts not being discussed until after World War II (p. 51)). But there was also interest among the engineers in many metal-working firms in the relation between efficiency of individual processes and the overall profitability of the firm; and in ensuring that products were priced properly by building up product costs, including allocation of 'overheads'. In their view 'overheads' included not just factory costs, but all the costs that were ultimately necessary to produce and sell the product, including selling, general and administrative costs (and often imputed interest on equity). J&K give particular attention to the writings of Alexander Hamilton Church in the early twentieth century and his attention to tracing the 'connection of expenditure of all classes with the items of output on which they are incident', and 'the difference in rates at which products consume resources' (p. 55). It is doubtful that many firms actually implemented a system as complicated as Church's (the data handling costs would have been prohibitive) but his approach forms the basis of J&K's own 'remedies' in part three, as they believe the fall in cost of data processing now makes them feasible.

According to J&K, the final developments in MAS took place in the early decades of the twentieth century. That era was characterised by the emergence of giant vertically integrated firms (e.g. Du Pont) and diversified multidivisional firms (e.g. General Motors). In the first case, top management was faced with the problem of the centralised coordination of the diverse activities of vertically integrated business units and of ensuring the most profitable allocation of capital to these activities. In order to cope with these problems effectively, Du Pont invented 'return on investment' (ROI) which provided not only a summary statistic of performance but analysis of it through the famous 'Du Pont' formula and which measured the commercial success of each of the diverse activities as compared with alternative uses for capital as well as the financial performance of the firm as a whole. J&K stress however (p. 85) that this did not mean that Du Pont's managers 'ran the company by the numbers'. ROI reports were for top management only, and subordinate managers were not compelled to achieve ROI targets.

Diversified, multi-divisional firms (characterised by Williamson as 'American Capitalism's most important single innovation of the 20th Century' (J&K, p. 95)) were faced with the problem of coordinating widely dispersed and decentralised activities. The pioneering giant, General Motors, raised the power of its MAS by developing it to transmit corporate goals unambiguously to division managers. Each division manager was made responsible for attaining a target ROI while having authority to make capital requests and freedom to exercise initiative in performing operating activities. The company also developed various detailed measures to facilitate 'centralised control with decentralised responsibility'. These included benchmark standard prices, divisional annual and monthly operating forecasts, prompt sales reports, flexible budgets, market-based transfer prices, and executive incentive schemes which were frequently awarded in the form of rights to General Motors common stock.

J&K conclude this part by noting that, faced with the problem of controlling diverse activities, products and functions, managers in the late nineteenth century and early twentieth century could not develop MAS along the lines recommended by Alexander Hamilton Church as the costs of the necessary information processing would have been too high. Instead they devised new organisational structures and corresponding reporting methods to allow top management to exercise strategic control without becoming enmeshed in the details of daily operations, and thereby performed more effectively by internal allocation what would otherwise be left to the markets for capital and managers. However, J&K question whether, with falling information processing costs, and falling costs of using markets for capital and managers, the 1980s should see more 'downsizing' and 'unbundling' of large multidivisional conglomerates.

The Shift from Cost Management to Cost Accounting

In the second part of the book (chapters 6-9) J&K trace out what they call the shift from cost management to cost accounting and the 'consequent' obsolescence of MAS in the 1980s. They argue that by '1925 virtually all management accounting practices used today had been developed'. The last 60 or so years have been identified by J&K as a period of stagnation where MAS failed to attend to the information needs of modern production technologies and global competition, and thus became irrelevant. While acknowledging that a full historical investigation of the causes is still needed, J&K attribute this stagnation, in part, to the dominant concern with financial accounting statements during the twentieth century (a dominance reflected in the belief expressed in many modern textbooks that cost accounting is only a by-product of financial accounting (p. 140)). The emergence of modern corporations with widespread public ownership coupled with periodic crises in capital markets increased significantly the demand for audited financial statements. These were based on conservative accounting practices and emphasised objectivity and verifiability at the expense of relevance (for example by using historical cost rather than replacement cost calculations). They also emphasised accuracy in aggregate values at the expense of accuracy at the level of individual product costs. Given the state of information technology at the time, it would have been too expensive for firms to maintain MAS separate from the financial accounting systems.

But now the irrelevance is getting worse as the cumulative effects of managing by inappropriate numbers build up. Three particularly damaging effects are:

(i) *short-termism:* In their present day form financial accounts increasingly focus on short-term results/quarterly earnings at a time when the consequences of management decisions to invest in research and development and the careful design of new products are increasingly long-term.

(ii) *the failure of the control function:* The form and timing of accounting information is systematically unhelpful, being too aggregated and too late for operational control.

(iii) *the failure of academic accounting:* Although some writers in both the US and UK (e.g. at LSE in the 1930s) have focussed on the fundamental inconsistencies of routine financial accounting techniques with the needs of management decision making, in J&K's view most academic writing has stayed effectively within the financial accounting framework (e.g. by advocating 'direct' versus 'full absorption' costing). Methods of analysis have been mainly deductive and based on simplified decision-making settings (for example single-product, single-process situations) abstracted from experience of the major problems of MAS in operation. Research in the Business Schools has lost touch with real world concerns.

So, 'management accounting' has supplanted cost management and systematically introduced major dysfunctions into the whole management process. First, present MAS are still focussed on the 'rational' apportionment of overheads on the basis of direct labour even though labour itself has become an insignificant proportion of total product costs. Precious managerial time gets wasted on engineering negligible savings in labour costs to reduce the burden of apportioned overhead instead of investigating and containing the substantial overhead costs themselves that are incurred by the firm as a whole, and obtaining a more realistic understanding of which processes and products actually give rise to the greatest use of resources. Second, the modern manager in 'managing by the numbers', has effectively become a portfolio investor (p. 200) characterised (p. 202–5) as (i) driven by the stock market's demands for short-term performance, (ii) reinforced by an executive bonus scheme based on the financial accounting results, (iii) promoted before the consequences of his decisions become manifest, (iv) typically an MBA or CPA, having little technological or production experience, and finally (v) reliant on an obsolete MAS for information about the performance of the business.

Recent developments in the nature of market competition and production technology have exacerbated these limitations. The markets of the 1980s are characterised by very intensive global competition. Moreover, deregulation of transportation and service industries has resulted in a significant increase in the extent of domestic US market competition. Several international competitors, particularly the Japanese and West Germans, have perfected new path-breaking innovations in production technologies, such as total quality control (zero defects), just-in-time inventory, computer-integrated manufacturing systems, and short product life cycles. Despite these major innovations, US MAS have remained oblivious to change and failed to provide managers with the information they need. In particular, the substitution of capital intensive technology for labour—'advanced manufacturing technology'—has dramatically increased the need for MAS that can report useful information about 'fixed' overheads.

The Remedies

In the third part of the book (chapters 10–11) J&K propose some remedies which, they hold, should render MAS more relevant. First, they suggest that MAS attend adequately to the different time frames for the activities undertaken by the firm. Thus, in the case of process control MAS should have reporting cycles specific to the process being controlled, for example 'on line', hourly, daily, weekly, and so on. In contrast, in the case of product costing, MAS should evolve a much longer time horizon, because, despite the emphasis on short-term decisions in many management accounting texts, the long-run variable costs (those which are often fixed or 'sunk' in the short-term) are the most relevant when estimating product costs and the profitability of activities for strategic decisions. Given the vast differences in relevant cycles for different activities, J&K propose that different MAS are developed by each firm to attend to these cycles.

Second, the role of cost allocations for process control should be different from that for product costing. Cost allocations for process control should reflect managerial responsibility and be focussed on flexible budgets: hence only minimal allocations should be performed. In contrast, cost allocations for product costing should be extensive given that the main objective is to trace virtually all costs to products so that informed strategic decisions can be made about product development and discontinuance. Cost allocations should be based on primary cost 'drivers', i.e. by identifying what are the product requirements that drive the level of overhead activities and in particular the level of transactions in service and central departments. These costs include not only obvious production-related costs but also those of administration, marketing and distribution. In general then, 'process control information will be objective and measurable; product costs will be subjective and the result of an allocation procedure' (J&K, 1987, pp. 249–250). Cost information for financial reporting will lie somewhere between these two extremes, as financial reporting requires some allocations, but these can be arbitrary as financial reporting is not greatly concerned with the accuracy of individual product costs, and for financial reporting purposes marketing, distribution and administration costs are treated as period expenses.

Third, J&K propose that future performance measurement systems should move away from emphasising short-term profits towards long-term measures of performance. Further, non-financial indicators should be accorded greater importance. These indicators can highlight company performance in various key areas such as manufacturing, marketing and R&D.

Critique

The two main strands of J&K's thesis are therefore an account of the historical development of cost management and cost accounting in the USA (their diagnosis of the causes of the present 'disease') and some prescriptions for future action—based largely on modern Japanese practice (their remedy). In this and the next section we challenge both their diagnosis and their remedy, and suggest alternative ways of accounting for the 'problem' with cost accounting.

History is more than events. It is, as J&K demonstrate, directly relevant to understanding the way business works now, for there are certain structures and ways of intervening in the world which, once invented, have proved so powerful and compelling that they cannot be denied. Accounting became such a structure and such a way during the 19th century. In this respect we fundamentally concur with J&K, particularly for the way in which they have moved accounting's *history* centre-stage in the search for a better understanding of accounting's power.

But we do not agree with the precise history that they tell, nor with the understanding of accounting and its power to which their history leads them. They tell a history of a practice that in its inception and down to 1925 was basically 'good' (i.e. on the right lines) but which then went increasingly wrong. We on the other hand would argue that cost management based upon accounting was problematic—and bound to be problematic—from its outset, and that this is what the history of 19th century accounting (for example the debates over how to find 'true cost') shows. From their account of the historical development of cost management and cost accounting J&K derive a diagnosis of the causes of a modern 'disease'. But we would maintain that there is not a disease which has developed as accounting has 'gone wrong'. Accounting's problem lurks within it from the outset and there is unlikely to be any quick and easy remedy. A different history requires us to develop a different way of accounting for the 'problem' with cost accounting.

First the history. As with any historical analysis, the first question is 'where to begin?'; in other words, at what point in time and place does one identify the crucial discontinuity from the past that marks the beginning of a new era? J&K focus first on the textile mills in the US and, in particular, the Lyman Mills from the 1850s, where records incorporated in the double entry system the cost of cotton goods produced (including material, labour and factory overheads). They also mention the earlier records from the Lawrence company (Porter, 1980). We would add that, thanks to the work of scholars in recent years, there is nowadays no shortage of early examples of cost calculation, especially in Britain: e.g. the Charlton Mills by 1810 (Stone, 1973); Wedgwood's eighteenth century pottery (McKendrick, 1970; Hopwood, 1987); and the many examples from South Wales at the end of the eighteenth and beginning of the nineteenth centuries (Jones, 1985; Edwards, 1989), as well as the early textbooks (Mepham, 1988).

The conclusion that we draw from all these counter-examples is that history is more than events, and that there is something counterproductive in searching for the first 'event' where financial accounts can be found being adapted for cost calculation. There is indeed no *a priori* reason why this event should not have occurred at any point following the invention of double entry bookkeeping in the late 13th century. Whatever the earliest theoretical demonstration or practical example we know of now, in ten years' time we are almost certain to have found others. Moreover, however many examples we find, they will still not be proof that modern 'managing by the numbers' was at work. *That* is the significant thing for history to do: to discover the point of discontinuity between the pre-managerial and the managerial world: to define and ascertain the difference that made the difference.

There is one particular historical episode where we see that kind of transformation. It is an American episode cited by J&K (p. 44, fn. 6) at the Springfield Armory, which has long been regarded as the key institution in the development of the American system of manufacture (Smith, 1981; Uselding, 1973; Hoskin & Macve, 1988a).

Springfield at first seems an unlikely candidate for siting the crucial discontinuity. J&K regard Springfield, like Wedgwood's pottery works, merely as one example of the situations where the move toward cost accounting is seen in early proto-factories where organisers of partly market-priced and partly managed production processes compiled production statistics—not systematic cost accounts, as such—to audit the output of subcontractors or internal artisans. In their view, cost records were not needed if market prices were still being paid, the main function of cost accounting, when it appeared, being to provide 'synthetic' prices as administrators assumed the task of co-ordinating inputs into outputs with no intermediate 'market' transactions.

So they argue (pp. 22–4) that entrepreneurs did not need cost accounting, even where co-ordinating multiple processes in proto-factories, as long as they were paying market prices—a piece-rate—for the output of each worker:

> In the factory, wage contracts were substituted for market piece-rate contracts, and overhead items such as hauling and repair work also began to be supplied internally, not subcontracted. No automatic market signals existed to allow one to evaluate internal intermediate output . . . the missing information being, of course, the worker's productivity during the time he earned his wage . . . (E)arly textile factory cost accounts match the wages paid to workers with the output produced. These 'accounted' cost per unit figures were analogous to, if not the same as, the prices paid for intermediate outputs in the market. Most important, they provided a rational basis to evaluate internal conversion costs and to compare these costs with external market prices.

Hence their view that the first serious examples of the new cost accounting are the US textile mills in the 1850s. But even in terms of J&K's own 'market-price' analysis Springfield is a crucial case: for the essence of the US Ordnance Department's argument for introducing a military-based discipline at the armory was that the 'market' piece-rates being paid were not imposing the necessary discipline or securing the necessary efficiency in labour (Hoskin & Macve, 1988a).

The 'market' was not working. The Armory was supposed to be run, not for entrepreneurial profit, but for the public service; it was the major employer in the region; and (as illustrated even more vividly at the other US Armory, Harper's Ferry) it was a political football and seedbed for influence peddling. It became apparent that it was not 'rational' for it to act merely as a 'price-taker' in an 'efficient market'—like major government defence contractors today it was as much a 'price-maker'. Outside contractors' prices were also determined by the costs established at the Armory (Deyrup, 1948). Hence there was an overriding need to establish whether the piece-rates were 'fair' prices, as the 'market' signals were an inadequate guide.

The Rise of Managerialism

The interesting feature we would emphasise here is that, although a 'market failure' may have provided the occasion for change, changes when they were made went far beyond the demands of economic efficiency, and were introduced by a new brand of men—'managers'—who had no 'entrepreneurial' stake in the outcome (Hoskin & Macve, 1988a). It is primarily for this reason that we see the crucial discontinuity that occurred at Springfield to have been the beginning of *managerialism*. Today managerialism is everywhere. In the modern organisation virtually nothing can be done without passing through management levels, and for the individual, managerial status is a prized possession. But managerialism had to be invented. The conclusion of Sidney Pollard's seminal work, *The Genesis of Modern Management* (1965), still rings true (p. 250) in that down to 1830, the historical evidence fails to support the idea that either of the preconditions for managerialism had been met: (i) there was no knowledge base constituting 'a management science or at least a management technology', and (ii) there was no category of workers who could be designated a 'managerial class'.

The defining features of managerialism can be variously rehearsed. From one perspective they are as Pollard suggests: a specialised body of knowledge (more than just informal 'know-how'), and a specialist body of men, and now also women, who learn and then implement it. In the twentieth century managerialism has increasingly become connected to specialist formal training and certification, increasingly undertaken in business schools, where a large proportion of managerial research and development also takes place.

From another perspective, the key features of managerialism are the practices and processes of control that define management-in-action (some though not all of which are accounting mechanisms). We know well how to characterise them, taken *en masse*. They continually exhibit 'increasing traits of standardisation, clarity, rationality and order' (Ferris & Haskins, 1988, p. 3).

There are two other revealing ways of defining managerialism, which are less often employed perhaps because they are a further level removed from the practice itself, at a kind of meta-level of analysis. They are no less important for that.

First, managerialism institutes a certain way of constructing space/time relations, thereby defining life-structures for those who work within it. Concerning time, its distinctive temporal structure looks constantly towards the future (defined as short, medium and long-term) through the medium of past and present performance. Concerning space, its reach is both extensive and intensive, aiming to penetrate, know and control both the furthest reaches and the inner corridors of organisational space. On both dimensions it therefore embodies forms of 'action at a distance': but an action which is most meticulous in its concern for detail. Thus for the humans who occupy the organisational space/time continuum, managerialism can represent a quasi-ubiquitous knowledge of and control over them, even when they themselves occupy senior management positions. And this is not necessarily sinister: it can be and often is for the good of the individual and the good of all that managerialism operates across space and time in this way, so that each and every person, and function, can be more fairly and objectively evaluated, rewarded and corrected, in the present and into the future.

Second, managerialism operates and acts through a certain distinctive form of discourse. First and foremost, it operates and acts through writing. For action at a distance, whether over space or time, is effected primarily through writing and only secondarily through speech. Furthermore, it is effected through certain specific kinds of writing. Managerialism shares with bureaucracy its dependence upon memos, directives and orders—it is 'grammatocentric'. But it also generates a whole set of variations on the written theme: pictorial and diagrammatic writing (the organisation chart, the flow chart, the graph, pie diagrams, etc); and of course all the multiplicities of data set out in numerical format, not least of which are the accounting data and, in particular, cost accounting.

Managerialism's early manifestations were, naturally, far removed from the sophistication of today's management control systems, but the essential elements are to be found, we would argue, first at Springfield and then in the early US railroads (Hoskin & Macve, 1988a), both of which played crucial roles in disseminating management practices to other industries.

We will restrict ourselves here to discussion of Springfield, since that is where the first principles for the kind of managerialism we describe here were worked out. (Meanwhile we cannot see any culture of managerialism in the way the US mills were then run. It is difficult to be clear how the information in the early US mill accounts described by J&K was used—the agent running the Lawrence mill in 1834 took a fairly cavalier attitude to them (Lubar, 1984, pp. 24–26; Hoskin & Macve, 1988a, pp. 70–71). But the significance of the developments at Springfield is much clearer.) At first sight Springfield looks an unlikely candidate for cost control innovation, since the records had not yet made the technical advance to cost recording within a double entry system. As a public sector institution it was still essentially using 'charge and discharge' (Hoskin & Macve, 1988b).[2] But in our view the importance of technological development lies not so much in the techniques themselves as in the use to which the technology is put: in this case the introduction of a new principle of disciplinary power into the running of a business organisation.

The change was dramatic, and originated in 1832, when, as part of an inspection of the armory, a young officer Daniel Tyler carried out what can be seen as the first recorded 'time and motion study' (Hoskin & Macve, 1988b). Although not mentioned in the official report of the inspection, it is clear from Tyler's own autobiography (Tyler, 1883) that he spent six months 'watch in hand' carefully observing and timing every operation in order to determine a 'fair price' for each division of piece-work. That price was not based on past historical practice as such, but upon a *norm* of what the good worker working solidly could and should achieve. There appears to be no historical precedent for this kind of standard setting. It was derived from Tyler's examination of what the workers did and his data-based extrapolation of what could and should be done.

What Tyler did was to impose a new way of seeing each individual worker in terms of norms and deviations from the norm. (Individuals only became a problem, or a success, when they deviated significantly in either direction.) At the same time he imposed a new way of seeing the workplace as a whole. In 1832 there were more than 100 job categories within the Armory. Tyler's examining eye imposed a different order of rationality upon this totality, by reordering the workforce into just six classes of worker, each determined by the 'degree of skill and intelligence necessary' for proper fulfilment of work at that level.

There is not space here to explore the full significance of Tyler's breakthrough in cost management. Due to labour resistance and army politics, it was not until 1842 that, with the installation of a military superintendent at Springfield, Tyler's reform was fully implemented (see Hoskin & Macve, 1988b). But we see as crucial the principle of *discipline* that was engendered in the ability to write new measures of human performance. As has been argued elsewhere (Hoskin & Macve, 1988a), the genesis of this discipline can in turn be seen, not as merely military discipline (which others, e.g. Smith, 1981 and Hall, 1982, have argued was the crucial element needed for the organisation of large-scale American industry) but as the educational, mark-based, written, examinatorial discipline experienced by Tyler as a student at West Point, as well as by its other engineering graduates who were to form the most significant cadre of 'management consultants' on the early US railroads—the first large-scale multi-divisional organisations (where Andrew Carnegie in turn served his apprenticeship).

---

[2] Bob Parker has pointed out to us that a further question for historical research is whether the highly personalised accountability for money and materials effectively secured by the charge and discharge form of account may itself have provided a more fertile ground for the development of modern styles of performance measurement and control than the structures of double entry bookkeeping.

At West Point Tyler and the others learned for the first time under continuous examination in the modern taken-for-granted fashion, as members of a class who were in constant competition with each other, and who as individuals were given continual evaluations of their self-worth by the numerical marks which they obtained cumulatively each day of their academic career and internalised in a new self-discipline of 'learning how to learn'. They were turned into 'calculable persons' (cf. Miller, 1989) and they later translated this lesson in power/knowledge relations into the world of work. Thus they could invent the new real world of managerialism, and at Springfield Tyler turned the workforce into a cohort of 'calculable persons' who could thereby be 'managed'.

Scientific Management

There are also striking echoes of Springfield (as noted by Chandler, 1977) in the scientific management of the 1880s. As J&K describe it (pp. 47–51) a new 'scientific quest for knowledge about efficiency originated in metal-working firms whose owners desired closer control over increasingly complex and specialised manufacturing tasks'. Until the 1880s manufacturing had been organised largely through inside contracting (as illustrated at the Winchester Repeating Arms Company), i.e. on a piece-rate basis. But now many manufacturers began to dismantle the inside contracting system in order to capture any benefits of improved efficiency for themselves, rather than for the contractors, and to cope with the problems of excess capacity. They now needed a hitherto irrelevant level of knowledge about the detail of the organisation of material and labour in the production process and 'by the 1880s managers of many complex metal-working firms had information about material and labour costs similar to the conversion cost information that already existed in textile factories and steel mills'. Some of the 'engineering-minded', 'scientific' managers went further and 'focussed their attention on predetermining "standard" rates at which material and labour should be consumed in manufacturing tasks . . . including engineering design of bills of material and time-and-motion study'. Over the period to World War I different objectives for using the new information emerged: Taylor concentrated on physical labour and material efficiency; others such as Longmuir on financial efficiency and standard costs; while some accountants (not engineers) focussed on the use of standard costs for inventory valuation in financial accounting reports.

The situation faced by the metal-working manufacturers in the 1880s in bringing the workforce and the manufacturing process under their direct control and reducing the power of inside contractors appears to us however as essentially similar to that at Springfield at the beginning of the century. Springfield, right from the beginning, had its own managed work-force, even though inside contracting was normal for the industry and was used at Harper's Ferry (Deyrup, 1948, p. 101). Indeed Springfield was being held up at the end of the century as an example by the younger, technically trained 'Taylorist' managers at the Winchester Repeating Arms Company in urging the replacement of contractors there by managers (Buttrick, 1952; Englander, 1984). It is hardly surprising that we find the 'scientific management' attitude being displayed by 1832 at Springfield in a process of work and time control which, by 1842, finally 'broke the back of labour resistance' (Hoskin and Macve, 1988b).

Tyler's achievement was to invent Taylorism *avant le mot* (cf. Miller and O'Leary, 1987). His study (a) redefined jobs into a simplified rational structure on a basis of 'scientific' observation, and (b) constructed scientifically determined norms of performance, upon whose basis piece rates were then determined. From 1842 on the Military Superintendency, which also enforced the discipline of a clock-regulated, full working day, ran this new 'normalised' workforce through the books. Detailed records of actual performance were kept, deviations from performance norms acted upon (including behavioural norms of conduct and punctuality), and workers were paid only for effective work done so that the new accountability became internalised through incentives to self-discipline. Within three years, in the barrel-welding shop, piece rates halved and production doubled. Thus discipline-based knowledge was put to use to construct an economically effective new work discipline. And the organisational outcome was managerialism.

One can therefore see the *disciplinary* perspective on this new writing of the structure and dynamic of organisational 'reality' as underlying the whole history of the development of cost and management accounting throughout the nineteenth and twentieth centuries and as essential to an understanding of both its 'rise' and its 'fall'. 'Managing by the numbers' (Geneen and Moscow, 1984) is not a 20th century 'subversion' of an originally 'useful' cost and management accounting—J&K's thesis (pp. 254-62)—but was genetically implanted in the seed from which that accounting was generated. The Springfield workers were the first to become *accountable* under the new system; then in the railroads it was managers who became accountable, in a system of mutual surveillance that has been described (following Foucault) as one of 'reciprocal hierarchical observation' and 'normalising judgement' (Hoskin & Macve, 1986).

This is not the place to expand these arguments (see Hoskin & Macve, forthcoming) or to take them forward through the following century and a half of development of MAS and their linkage (through ROI) with, and ultimately dominance by, the perspective of financial accounting (the accounting by which managers in turn are made visible to stakeholders outwith the organisation but which also makes visible the claims exercised and the shares of results extracted by the most powerful of them—in particular the suppliers of capital and the State). Accounting then becomes the currency through which managers gain power in the arenas of cooperation, competition and conflict with other vast grammatocentric organisations: rival competitors, governments, financial markets. 'Managing by the numbers' is a *sine qua non* of modern organisational life.

We hope enough has been said to indicate that there are other views of the relationship between changes in business organisation and the development of MAS than the essentially 'Chandlerian' view expressed by J&K, that developments occurred as rational businessmen responded to the opportunities of new technologies and new markets, while sensibly weighing up the cost of internalising the control of yet more activities. We note in particular that those who introduced the developments at Springfield (and later on the railroads) were in the main short-term salaried employees, with no obvious stake in or pay-off from their inventions other than the intellectual, professional reward of finding a problem and solving it. And, as Chandler (1977) himself has observed, their innovations went well beyond the rationalism of economic efficiency. They appear more like knowledge experts of a particularly modern kind—the consultant—than profit-maximising entrepreneurs.

Other approaches can also be taken. As has been mentioned, there are those who see the crucial element in the development of big business as being the impact of military discipline; others who see accounting as a weapon in the process of class struggle, assisting the various stages of capitalist exploitation of labour (e.g. Hopper, 1988). Enough, we hope, has been said to indicate that the J&K thesis cannot be taken as self-evident; other histories can be written. J&K have rightly emphasised the importance of historical understanding in diagnosing the present and perhaps suggesting how future progress can be made. But if that history—the foundation of their diagnosis—is debatable, then so also are their proposed remedies. To these we now turn.

An evaluation of the J&K recipes

Even though they are critical of the failure of MAS to meet the needs of modern organisations, the overall purpose of the J&K thesis is to point out how the competitive position of American firms may be rescued. Their main remedies are premised on (i) abandonment of the integration of financial and cost accounting and a return to the cost management principles of Alexander Hamilton Church (which the fall in data processing costs makes feasible) and (ii) imitating the practices of the successful Japanese companies and allowing explicitly for the incorporation of their management approach in the design of MAS.

Others have criticised the feasibility of the first remedy and disputed its likely effectiveness (as well as questioning whether nineteenth century cost allocation systems were free of the disease) (e.g. Wells, 1978; Noreen, 1987; Bromwich and Bhimani, 1989). We also note that Church himself was concerned with the 'synthesis' of the profits and losses on individual products into the overall financial position (J&K, p. 53) and that (perhaps unlike the Lyman mills (J&K, p. 28)) the Lawrence Manufacturing Co. accounts for 18 February 1848 (Porter, 1980), which we have inspected in the Baker Library at Harvard, integrate the mill and product costs and profits completely with the general ledger trial balance and profit and loss account, apparently using a unit price based on the calculated unit cost of manufacture (which comprised cotton, labour and all 'general expense'), or the selling price where lower, to value the closing inventory quantities of manufactured cloth. There is still a need for further detailed work to be done on the precise forms of cost accounting before and during the nineteenth century.

The Illusion of the 'Japanese' Cure

But let us turn to J&K's second remedy—the 'Japanese' cure. This type of remedy has been advanced before by numerous American and Western European business writers. For example, Ouchi (1981), Peters and Waterman (1982), and Pascale and Athos (1986) have maintained that much of Japanese management practice can be imported and grafted on to American business cultures successfully. Many of these writers cite some of the spectacular successes achieved by Japanese management techniques in what were previously ailing American companies.

One of the most frequently quoted examples of the transferability of Japanese management practices to other countries is the revival of the Motorola television plant in the USA after being taken over by Matsushita (e.g. Peters and Waterman, 1982; Kaplan, 1983; Pascale and Athos, 1986). Apparently, before the takeover by Matsushita, the Motorola plant had chronic problems in the form of very low productivity, an ageing work force, poor quality control, low morale, and a loss of $19m per year. Within only a few years of the takeover by Matsushita, productivity increased by nearly 40%, defects per 100 television sets were reduced from 140 to only 6, the warranty bill was reduced from $22m to $3.5m, the first ninety days (after sale) complaints were reduced from 70% to 7%, and personnel turnover was reduced from 30% to 1% per year.

These are clearly very impressive achievements: yet most of them were the result of hard-nosed management practices exactly akin to those espoused by mainstream Western business culture. According to Pascale and Athos (1986, p. 38), immediately after the takeover Matsushita 'began slashing costs, furloughed all production employees for one month, forced early retirements, demoted redundant supervisors, eliminated cost-of-living increases, and dismissed one third of management'. Certainly, other practices more in line with the Japanese management style were employed. For example, executives were sent off to Japan for training, Japanese consultants were sent to the US plant, weekly meetings were held, and task forces were created. But it is hard to imagine that many of these measures would not have been taken by a vigilant American or Western firm which might have taken over the ailing Motorola plant. It would be an acute case of 'Japan daze' to put the success down exclusively or mainly to Japanese management *practices* even if there was a major input from Japanese management style.

There is a benevolent side to the Japanese management style. For example, in Matsushita praise and rewards appear to permeate the whole organisation. Employees are encouraged to come up with suggestions for improving tasks, work practices and means of accountability which are assessed and scaled according to merit. In 1979, over 25 suggestions per employee were received and 90% of them received monetary rewards. One is almost excused for thinking that such humanly oriented behaviour is a Japanese invention, whereas in fact it is its absence in many American and Western organisations that is perplexing, given the very rich and insightful organisational and behavioural accounting literatures which have accumulated over the last six decades (see Ezzamel and Hart, 1987, for a review of these literatures).

But there is a darker side: several leading Japanese companies apparently operate with oppressive, almost non-humane systems (see, for example, Kamata's (1983), depressing account of how seasonal workers were treated at Toyota) and the exploitation of female workers (Harris, 1987). Taken together these apparent opposites demonstrate how effective is the Japanese implementation of a disciplinary system. Such a system should always play upon the interrelations of reward/punishment, success/failure, self-esteem/humiliation in combining power and knowledge practices in order to manage an organisation via a regime of calculability. The question to be asked is: what currently makes the Japanese variations on the disciplinary regime so effective?

Recent visitors to Japanese firms have confirmed the impression given by Ouchi (1981) and Choi & Hiramatsu (1987) that Japanese management in fact places very little reliance on accounting measures on the shop floor (being well aware of their deficiencies in reporting economic reality and suspicious of the fictions they create), preferring to focus much more on physical measures of output—not so much to measure 'variances' but to ensure that targets are met and to require continual improvements in the targets. Management places more emphasis on communicating these physical targets to workers (which are simpler to comprehend than financial targets) and on NCO-style physical contact with workers than on officer-style managerial analysis of accounting and other reports—a manager's 12 hour day might consist of 5 hours of meetings, but 7 hours of 'walking the floor'. Social controls operate through small-group loyalities (a group may lose its 40% bonus if one worker fails to meet the target; everyone in the group in turn is expected to put forward a suggestion for improvement: Kamata, 1982; Pascale & Athos, 1986), and through visible disgrace—such as different haircuts for different offences.

These are the educational/military forms of discipline reminiscent of those to be found in early American factories, utilising the psychology of public shaming like Robert Owen's 'silent monitors' at New Lanark (Hoskin & Macve, 1988a, 1988b; cf. Walsh & Stewart, 1988). Thus the role and effectiveness of accounting controls in an organisation can only be assessed within the context of the whole disciplinary matrix of controls in force.

The Behavioural and Organisational Contexts of MAS

If J&K are looking for remedies for the perceived malaise of MAS in the West we believe that the focus should be not so much on the techniques of cost calculation and identification as on the behavioural and organisational contexts in which the MAS are operated. In extolling the virtues of American enterprises that have been successful in the past, many researchers do not appear to have appreciated some of the deep rooted behavioural limitations of these organisations while at the very pinnacle of their success. Over the long-term, it is these problems that have probably played a major part in undermining the competitive position of American and Western organisations.

General Motors ('GM'), which J&K examine, has been one of the most seriously studied business organisations of our time. Its extraordinary success made it the model for other organisations to imitate, and its organisational design, managerial practices, and accounting systems became the gospel of Western business practice. Similarly GM had a major influence on academic literature (see, for example, Drucker, 1946; Chandler, 1962; Williamson, 1970, 1975; Kaplan, 1983, 1984).

There is no doubt that GM pioneered some important accounting innovations which deserve much praise. Such innovations, however, related to the technical, rather than the behavioural, aspects of accounting. The accounting knowledge was highly developed, but in crucial ways the power of accounting over the behaviour of members of the organisation was underdeveloped.

GM's structure of divisional organisation—to separate top management strategic decisions and essential management operating decisions—was extremely effective, but one price that was paid was loss of loyalty to the corporation as a whole. The responsibility accounting system focussed on the consequences of divisional operating decisions. Among functions delegated to division managers were the recruitment and training of their divisional employees. Clearly, different divisions had differing staffing policies. More importantly, loyalty to the division, rather than to the company, was probably the outcome of decentralising the recruitment and training of employees. In summary, GM had no company-wide recruiting or training policy, and no system for human resource development and accounting (see Sloan, 1963; Pascale and Athos, 1986).

In contrast, Matsushita centralised what it believed were crucial managerial levers: personnel, capital budgeting and accounting. In Matsushita, employees were apparently viewed as the critical resource of the company. Up to the present day, all employees above junior high school graduates are recruited after central pre-screening. Further, all Matsushita employees go through a centralised basic training system which emphasises corporate ethos. Much effort is spent at Matsushita to improve staff development. Several writers have attributed these practices to the 'unique' art of Japanese management. Yet, one need only refer to the voluminous Western psychological and sociological literatures to appreciate that hardly any of these practices were the exclusive invention of the Japanese. Rather, many Western organisations have ignored behavioural research findings and persisted in pursuing arcane practices in which human beings are treated as little more than 'cogs in a well oiled machine'. They have failed to carry through the logic of 'management by the numbers' and have operated with an inadequate view of the 'calculable persons' who inhabit modern managerial organisations. The weakness in the GM approach was that it ignored the fact that persons rendered calculable do not passively accept this new reality: they sooner or later begin to calculate their own self-interest.

A further illustration of the failure of GM to achieve the most effective form of 'management by the numbers' (where the goals reflected in the numbers are internalised as calculated self-interest by salaried employees as they are by piece-workers) is the operation of the GM bonus scheme.

Sloan (1963) describes the bonus plan which was introduced by GM in 1918, and continued at least until the time he wrote his book. The plan is hailed by J&K as an important means of aligning division managers' goals with corporate goals (pp. 116–117). However, the way in which it was administered offers some revealing insights into the behavioural dimension of GM.

First, the forms in which the bonuses were delivered undermined the basic notion of an efficient external labour market on which Western business culture is weaned (e.g. Fama, 1980). Only one fifth of the bonus was paid in cash at the time it was awarded, with the remainder paid in the form of GM stock options in four equal annual instalments. Moreover, the employee could lose his right to receive his undelivered bonus instalments, which in some cases were very substantial, if he left GM. According to Sloan (1963, p. 427): 'The net result of this deterrent—plus the stimulus the plan provides—has been that over the years GM has lost relatively few executives it has wished to retain, especially in the upper levels'. Effectively then, the mobility of employees, particularly top executives, was curtailed as their career progressions were inextricably locked into GM. To an extent, GM internalised the managerial market arrangements, and this can be seen to minimise transactions costs. However, by depriving itself, and its managers, of the opportunities in the larger, external labour market, the company may have become isolated from the realities of the market place.

Second, personnel eligible for bonuses were drawn from salaried employees whose salaries exceeded a given limit. For example, in 1962 14,000 out of 150,000 salaried employees were awarded bonuses (9%), but only a proportion of those 150,000 had the right to be considered for a bonus by virtue of exceeding the minimum salary stipulated by the bonus committee. Worse still, the 450,000 non-salaried employees, who formed the majority of the total employees, were automatically excluded. Sloan (1963, p. 409) described those eligible to be considered for bonuses as employees 'who have contributed to its [GM's] success in a special degree by their inventions, ability, industry, loyalty, or exceptional service'. However, these qualities were assumed implicitly to be absent among non-salaried employees, who soon came to their own calculative conclusion—that there was nothing in it for them.

We have selected GM as an example because it has been the inspirational model for many organisations and business researchers alike and receives considerable attention from J&K; but there are numerous other American and Western organisations which have systematically undermined the importance of the human side of organisation. In the early 1950s, Argyris (1952) documented many of these problems, followed by McGregor (1960) and others through the 1970s until the present day (Pascale and Athos, 1986; Howard, 1986). But there have been exceptions, with some leading Western organisations employing human resource development systems of seemingly high quality (e.g. Peters and Waterman, 1982; Deal and Kennedy, 1982; Pascale and Athos, 1986; Rodgers, 1986). It is here that we believe further attention needs to be focussed.

MAS and Financial Accounting

In understanding the 'lost relevance' of MAS, attention also needs to be given to the relationships in which firms interact with external institutions through their financial accounting, and to how the behavioural and organisational structures within and outwith the firm mould and are shaped by the forms of accountability that financial accounting practices create. If one is judged by the numbers it is almost inevitable that one will manage by the numbers, and the technical criticisms of accounting's measurement practices and short-term focus should be directed equally, if not more, strongly at financial accounting, given the power it exercises in the UK and the US through the operation of the capital markets and regulatory bodies. Unlike J&K (who appear to regard financial accounting as satisfactory for its purposes) we believe that one cannot now divorce the problems of management accounting from those of financial accounting.

We hope we have said enough to explain why we contest J&K's 'remedy' which is essentially a re-application of nineteenth century cost management principles coupled with the use of Japanese management techniques. We doubt the efficacy of concentrating on technical improvements to MAS for two major reasons. First, the role of MAS cannot be divorced from the organisational context of the whole system of control. This has led us both to explore the different forms of control within which Japan's management practices have been developed, and to diagnose the failures which J&K attribute to Western MAS as rooted in their behavioural rather than their technical limitations. Second, the technical limitations of MAS cannot be divorced from the relationship between internal measurement of performance and its external measurement through financial accounting. Technical improvements in financial accounting are now likely to be of much greater significance. In short, we do not see modern MAS as having been perverted from nineteenth century origins and in need of rehabilitation. Accounting's 'problem' is inherently related to its power in performance measurement and in the creation of accountability. The 'problem' has been there from the beginning and it is as accounting's power in making performance visible has grown that the inherent problem has also become more visible.

Conclusion

J&K, in calling for a rediscovery of what they see as the nineteenth century virtues of MAS, have placed accounting history centre-stage not only in the research agenda, but also for practical business management. Their examples raise not only historical questions, but questions of international comparisons in management and accounting cultures. This is a major achievement and no student of accounting should fail to read what they have to say.

But inevitably the writing of history provokes re-writing. Here we have suggested that such re-writings are urgently needed if we are to understand fully the present day phenomena of accountability and managerialism. We have outlined our own view of accounting history which would locate the nineteenth century developments of MAS and the creation of the 'organisational' space in which managerialism operates in a wider genesis of accountability by which 'calculable selves' and 'calculable spaces' were created (Miller, 1989) and a new examinatorial mode of discipline, and more importantly self-discipline, was introduced into industrial organisation. The central technique of such calculation was, and remains, the use of the mark to grade human performance in education, and the use of money in business for both accounting and financial reward. 'Managing by the numbers' is the essence of accountability, and the manifestation of the power of the new knowledge.

In its alignment of the new knowledge with the disciplinary practices of power, Western managerialism stresses the calculable *self* (and in the West 'freedom of the individual' is the most sacred totem of our secular culture, as individual salvation is of our religious culture). The history of Japan is different and managerialism in Japan exhibits a different alignment of power/knowledge relations, which may be seen to reflect the greater cultural emphasis on group over individual values (Bromwich & Bhimani, 1989).

Morishima (1982) offers a revealing account of the history of Japan and how its unique history has contributed to its economic rise. Even though Japan imported Confucianism and Taoism from China, Morishima's analysis suggests that the geographical isolation of Japan, coupled with its unique traditions, combined to facilitate the engineering of important changes into these religions which rendered them significantly different from those of China.

Thus, in Chinese Confucianism benevolence (perfect love of humanity) was a central virtue whereas in Japanese Confucianism loyalty was the most important virtue. Further, loyalty in China meant being true to one's own conscience, but in Japan it normally meant total devotion to one's superior to the point of personal sacrifice even if that contradicted one's own conscience. This concept of loyalty was very much in accordance with Japan's warrior role. The Japanese operated a hierarchy of loyalties according to which every person pledged loyalty to the person immediately above him in the hierarchy, which ultimately generated loyalty to the emperor. Taoism, which in China promoted worldly happiness and at the same time, secluded, hermitic life, was transformed by the Japanese into Shintoism which promoted patriotism and Emperor worship. Shintoists advocate self-sacrifice for the good of the country and the emperor. According to Morishima (p. 18), 'Confronted by the great powers of the world, Confucianism and Shintoism collaborated; the former doctrine is perfectly suited to the construction of a constitutional-monarchic regime based on a modern bureaucracy, while the latter can easily serve as the catalyst to promote nationalism. It is therefore not surprising to find that Japanese capitalism was—and still is—nationalistic, paternalistic and anti-individualistic'.

We see the Japanese development of managerialism as reflecting these differences. Like Western managerialism, the approach is 'disciplinary' in the sense we outlined at the outset, i.e. crucially dependent upon the constant interaction between expert discipline-based knowledge and disciplinary work techniques. But the Japanese appear to have been able largely to refuse accounting complexity and develop the exploitation of group dynamics in a different balance of the written and the physical, and of individual and social control. Even the competitiveness and individualistic success of the Japanese 'examination hell', that wins the coveted place at Tokyo University and a 'job for life', is itself bounded within a social structure that is relatively immobile (Morishima, 1982, p. 183; Choi & Hiramatsu, 1987, pp. 196–217).

The significant problem to ponder is perhaps this. As Japan, the country which now has the world's wealthiest banks, becomes more open to the international capital markets, where economic power lies with a multitude of individual financial decisions, will it experience a re-alignment of the relationship between, on the one hand, the financial, accounting-based definitions of reality that provide the language of those markets and through them drive real-world management performance, and, on the other, the physical, engineering and human based modes of discipline that create performance in action? Or will the increasingly complex, integrated nature of advanced manufacturing technology necessitate a realignment in the US and UK away from the focus on measurement of individual performance and individual self-discipline towards greater emphasis on group interactions?

There appears to be a systematic contradiction in the relation between disciplinary power and the knowledge disciplines. The power system wants powerful knowledge, but the knowledge experts persist in producing pure knowledge, and the will to disciplinary power and the will to disciplinary knowledge do not therefore align perfectly. The will to knowledge undermines the success of disciplinary power, just as the will to power seeks to channel and harness the development of knowledge. Why should Japan prove the exception? Already a new generation is emerging there who are calculating that their self-interest lies in a more individualist lifestyle, which knowledgeably questions the values of the 'salaryman' and of the constant grind of trying to make the grade (Beauchamp, 1987). The history of Western managerialism suggests that management by the use of simple numbers will even in Japan become destabilised through the constant twin pressures of the will of experts to new disciplinary knowledge and the will of millions to deeper self-knowledge. Perhaps therefore, instead of attempting merely to improve Western MAS systems by the importation of techniques that are currently successful in Japan, we should be thinking systematically about the underlying accounting problem that has been there from the outset. How best can we make the accounting numbers work within the overall system of control so that they become really effective complementary and interlocking ways of both describing and driving real-world performance while being aware of and responsive to the ways that a population of calculable persons changes and evolves? A convincing solution to that problem of 'managing by the numbers' will be irresistible to managerialism everywhere.

References

Argyris, C., *The Impact of Budgets on People* (Controllership Foundation, 1952).

Beauchamp, E., 'The Development of Japanese Educational Policy, 1945–1985', *History of Education Quarterly*, 27, 3 (1987), pp. 299–324.

Bromwich, M. and Bhimani, A., *Management Accounting: Evolution not Revolution* (London: CIMA, 1989).

Buttrick, J., 'The Inside Contract System', *Journal of Economic History* (Summer, 1952).

Chandler, A. D., *Strategy and Structure* (MIT Press, 1962).

Chandler, A. D., *The Visible Hand* (Cambridge, Mass: Harvard University Press, 1977).

Choi, F. O. S. and Hiramatsu, K. (eds), *Accounting and Financial Reporting in Japan* (London: Van Nostrand Reinhold, 1987).

Coase, R. H., 'The Nature of the Firm', *Economica*, No. 4 (1937), pp. 386–405.

Deal, T. E. and Kennedy, A. A., *Corporate Cultures* (Addison Wesley, 1982).

Deyrup, F., *Arms Makers of the Connecticut Valley: A Regional Study of the Economic Development of the Small Arms Industry 1798–1870*, Smith College Studies in History, Vol. 33 (Northampton, Mass: Smith College, 1948).

Drucker, P. R., *The Concept of the Corporation* (New York: John Day, 1946).

Edwards, J. R., 'Industrial Cost Accounting Developments in Britain to 1830: A Review Article', *Accounting and Business Research* (Autumn, 1989), pp. 305–317.

Englander, E., 'Efficiency and Control in the 19th Century Firm: The Failure of the "New Institutionalism"', *Proceedings: Academy of Management* (1984), pp. 137–141.

Ezzamel, M. and Hart, H., *Advanced Management Accounting: An Organisational Emphasis* (London: Cassell, 1987).

Fama, E. E., 'Agency Problems and the Theory of the Firm', *Journal of Political Economy* (April, 1980), pp. 288–307.

Ferris, K. and Haskins, M., 'Perspectives on Accounting Systems and Human Behaviour', *Accounting, Auditing and Accountability* (1988), pp. 3–18.

Geneen, H. S. and Moscow, A., *Managing* (New York: Doubleday, 1984).

Hall, P., *The Organisation of American Culture, 1700–1900* (New York: New York University Press, 1982).

Harris, M., *Why Nothing Works* (New York: Simon and Schuster, 1987).

Hopper, T., 'Social Transformation and Management Accounting: Finding Relevance in History', presented at Second Interdisciplinary Perspectives in Accounting Conference, University of Manchester, 11–13 July 1988.

Hopwood, A. G., 'The Archaeology of Accounting Systems', *Accounting, Organisations and Society* (1987), pp. 207–234.

Hoskin, K. W. and Macve, R. H., 'Accounting and the Examination: a Genealogy of Disciplinary Power', *Accounting, Organizations and Society* (1986), pp. 105–36.

Hoskin, K. W. and Macve, R. H., 'The Genesis of Accountability: The West Point Connections', *Accounting, Organizations and Society*, (1988a), pp. 37–73.

Hoskin, K. W. and Macve, R., 'Cost Accounting and the Genesis of Managerialism: The Springfield Armory Episode', presented at Second Interdisciplinary Perspectives in Accounting Conference, University of Manchester, 11–13 July 1988b.

Hoskin, K. W. and Macve, R. H., 'Understanding Modern Management', *University of Wales Business and Economics Review* (forthcoming).

Howard, R., *Brave New Workplace* (Harmondsworth: Penguin Books, 1986).

Johnson, H. T. and Kaplan, R., *Relevance Lost* (Boston, Mass: Harvard Business School Press, 1987).

Jones, H., *Accounting, Costing and Cost Estimation: Welsh Industry 1700–1830* (Cardiff: University of Wales Press, 1985).

Kamata, S., *Japan in the Passing Lane* (Counterpoint, 1983).

Kaplan, R. S., 'Measuring Manufacturing Performance: A New Challenge for Managerial Accounting Research'; *Accounting Review*, October 1983, pp. 686–705.

Kaplan, R. S., 'The Evolution of Management Accounting', *Accounting Review*, July 1984, pp. 390–418.

Lubar, S., 'Managerial Structure and Technological Style: The Lowell Mills, 1821–1880', *Business and Economic History* (1984), pp. 20–30.

McGregor, D., *The Human Side of Enterprise* (New York: McGraw-Hill 1960).

McKendrick, N., 'Josiah Wedgwood and Cost Accounting in the Industrial Revolution', *Economic History Review* (1970), pp. 45–67 (reprinted in Yamey, 1978).

Mepham, M., 'The Eighteenth Century Origins of Cost Accounting', *Abacus* (1988), pp. 55–74.

Miller, P., 'Accounting and the Calculable Self', paper presented at the Ernst & Young Accounting Symposium, UCW Aberystwyth, 13–14 July 1989.

Miller, P. and O'Leary, T., 'Accounting and the Construction of the Governable Person', *Accounting, Organizations and Society*, 12 (1987), pp. 235–265.

Morishima, M., *Why has Japan Succeeded?* (Cambridge, 1982).

Noreen, E., 'Commentary on Relevance Lost', *Accounting Horizons*, December 1987, pp. 110–116.

Ouchi, W., *Theory Z* (Addison-Wesley, 1981).

Pascale, R. T. and Athos, A. G., *The Art of Japanese Management* (New York; Simon and Schuster, 1986).

Peters, T. J. and Waterman, R. H. J., *In Search of Excellence: Lessons from America's Best-Run Companies*, (New York: Harper and Row, 1982).

Pollard, S., *The Genesis of Modern Management* (London: Arnold, 1965).

Porter, D. M., 'The Waltham System and Early American Textile Cost Accounting 1813–1848', *Accounting Historians Journal* (1980), pp. 1–15.

Rodgers, F. G., *The IBM Way* (New York: Harper and Row, 1986).

Sloan, A. P., *My Years With General Motors* (New York: Doubleday, 1963).

Smith, M. Roe, 'Military Entrepreneurs', in Mayr, O. and Post, R., *Yankee Enterprise: The Rise of the American System of Manufactures* (Washington, DC: Smithsonian Institution Press, 1981), pp. 63–102.

Stone, W. E., 'An Early English Cost Accounting System, Charlton Mills 1810–1889', *Accounting and Business Research*, Winter 1973, pp. 71–78.

Tyler, D., *Daniel Tyler: A Memorial Volume, containing his Autobiography* (New Haven, 1883).

Uselding, P., 'An Early Chapter in the Evolution of American Industrial Management', in Cain, P. and Uselding, P. J. (eds), *Business Enterprise and Economic Change: Essays in Honor of Harold F. Williamson*, (Ohio: Kent State University Press, 1973), pp. 63–84.

Walsh, E. J. and Stewart, R. E., 'Management Accounting in the Making: Two Case Studies' presented at Second Interdisciplinary Perspectives on Accounting Conference, University of Manchester, 11–13 July 1988.

Wells, M., *Accounting for Common Costs* (Urbana-Champaign, Il: Center for International Education and Research in Accounting, 1978).

Williamson, O. E., *Corporate Control and Business Behavior* (Prentice-Hall, 1970).

Williamson, O. E., *Markets and Hierarchies* (New York: The Free Press, 1975).

Yamey, B. S. (ed), *The Historical Development of Accounting* (New York: Arno, 1978).

Accounting and Business Research, Vol. 20, No. 78, pp. 167–169, 1990

Ideal Solutions, PPTT, Abjuration and Logic

F. L. Clarke*

Professor Patz reopens my criticism of his 1977 case for the use of Purchasing Power Parities in translation in his 'Alternative Realities and Price Parity Translation' (ABR, Summer 1988, pp. 239–247). Patz is by far too adulatory in crediting me with as many records as he does—having most *logical fallacies* in one place, having achieved the impossible feat of linking them together in a manner which had eluded others before me, and having (it seems) set back the development of accounting policy choice (p. 239).

It is not my intention to reopen further our *translation* debate, *per se*. Patz has youth on his side, and 1999 is for me too far off to wait for the next round. Besides, the frontiers of our debate have changed: whereas Clarke (1978) was directed at the argument Patz had presented in the Winter of 1977, his 1988 response draws on his further contributions in 1977, 1978, and 1981. Nothing short of an extensive enquiry into them, too, would suffice. Nonetheless, a few defences against his criticisms are offered.

Polemical intolerance?

Patz dislikes my attempt to examine Purchasing Power Translation Theory (PPTT) without recourse to brute empiricism and pragmatism. It is true that I found no satisfaction in discovering a *theory of best fit* for extant practice. It is equally true that my argument was couched in terms of an ideal solution. For this one might be forgiven, as Patz gave no indication in 1977 that he was engaging in what he now calls a *comparative institution* approach (1988, p. 241), essentially an apologia for adopting the best patch-up mechanism in the context of conventional practice. His 1977 contribution was in a style implying the pursuit of an optimum solution to the problem. From this he now abjures, accusing me of unreasonably pursuing *Nirvana* and falling foul of all kinds of fallacies on the way; fallacies *in logic* we are led to believe, and given liberal quotations from Demsetz's (1969) descriptions thereof to prove it. 'Nirvana is a religious term', Patz explains (p. 242), to contextualise a 'religious ferocity' he attributes to me. But he is far from untouched by the exegesis of those to whom he refers so reverently.

Logical fallacies?

It is important to note that the commission of numerous *logical* fallacies is the accusation. Accordingly, we might presume that the indictment is that my conclusions do not follow from my premises, not that someone dislikes my premises, nor that someone disbelieves the truth of my premises and dislikes my conclusions. Let us examine each of the fallacies of which I am accused.

First there is the *grass is always greener fallacy*. This I am said to have committed by not subjecting my CoCoA/Exchange Rate (CoCoA/ER) mechanism to Patz's evaluative criteria, which I dismissed as unsuitable for the purpose. Now, that may have been an inadvertent error on my part, insofar as it was reasonable to have presumed that Patz wanted a theoretically sound translation mechanism too. We know that his real objective was to claw out and promote the best of the available extant institutional arrangements. That was not an issue which interested me in 1978. For it was, and still is, an inelegant approach to the development of a normative theory of accounting. But why that is supposed to entail a fallacy *in the logic* of my argument is unclear. Patz (drawing upon Abdel-Magid, 1979) posits that the fault lies in CoCoA's data being confined to numbers derived according to the classical measurement school of physics. 'Outside Nirvana', Patz explains, the world of accounting requires something different, namely *modern measurement theory* according to the dictates of the American Accounting Association. Patz might be hoisted with his own petard. What he perceives to be a logical flaw in the structure of my argument, in a curious way he now seems content to use for his own purposes to make the Demsetz litany fit. Moreover, by petitioning *outside Nirvana*, he might reasonably be taken to imply that within my framework my argument is valid, not fallacious at all!

---

*The author is professor of accounting at Newcastle University, New South Wales.

That probably explains why the *people could be different fallacy* gets rather short shrift from him. For, of course, they could be different. Who can deny that? It is rather difficult to imagine otherwise. The history of discovery, progress and development is the product of the acceptance of new perceptions, of recantations of what was previously perceived and believed. I am supposed to have the idea that no accounting data outside the CoCoA model are an economic good. Where did I say or imply that? And he invokes what most accountants 'currently accept' as the only criterion by which world views are able to be formed—a variety of medieval scholasticism which must automatically place the CoCoA/ER mechanism on the Index. My criterion of complete technical propriety comes under attack, for it lies outside Patz's experience, apparently is objectionable to him, and is not a current preference of accountants. Then comes an exhortation to prove his point. Again it is from Abdel-Magid, who asserts that great progress was made in certain social sciences *only* when the pursuit of (it seems) technical propriety was divorced from the research of social scientists. *How* is beyond comprehension.

The *free lunch fallacy* follows. Essentially this emerges from Patz's belief that I suggested, or implied, the CoCoA/ER mechanism was 'costless'. I did not make any such claim. In fact, no attempt was made to assess costs. I have no idea of what they would be, nor what the costs of not having a CoCoA/ER mechanism might be. I am quite content to accept that there is no such thing as a free lunch. But in the preamble to this accusation Patz explains that the free lunch fallacy typically begins with the use of ambiguous terms, in my case '... such ambiguous terms ... as contrivance, label and fiction ...'. From the style of his polemic thereafter, it is clear that Patz is confused. But he ought not to be, for those words were used with correct syntax and with their ordinary meanings according to the Concise Oxford. Of course, my real offence here was to have argued that his concept of 'place significance' served little purpose in the context of a translation of actual money data with exchange rates. 'Place significance' was his term, not mine. That it has a key role in his reasoning for PPTT is not disputed. That my dismantling of the notion offended the PPTT case is accepted and understood. But, having dealt with it to my satisfaction, there is not a rule of debate which required me thereafter to inject his notion into my argument for CoCoA/ER.

In the section Beyond Nirvana we are treated to another trilogy of supposed fallacies. First, there is the *blurred vision fallacy*—essentially that my vision of measurement (again) is inferior to that of Abdel-Magid. The argument is strange for it poses a *necessary* dichotomy of measuring (empirical) and rescaling (calculation) operations, in contest with my proposition that for practical purposes the distinction in a *process* of measuring physical properties of an object is of little help. My point in 1978 was that the cut-off is arbitrary, though important for the PPTT case, as no doubt it still is. These operations have 'different goals' we are told. Have they? Could not they be said to have different *functions*, both critical to the successful outcome of his common process? Then comes Patz's commentary on *Some of the parts equals the whole* and the *Hole equals the sum of the parts* fallacies, which could be indicative of his misunderstanding of *formal logic*. For the first (p. 244) he steps outside *the Nirvana*, which he says my argument pursues, and the *Weltanschauung*, in which my argument is set, and then attacks by appealing to what *he* perceives to be the real world. Interestingly he assesses some of his real-world translation operations in terms of my *technical propriety* which previously he had rejected. It is comforting to note that Professor Lee's (1972, 1981) cash flow accounting is said to be tarred with the same brush. Then (p. 245) he objects to the structure of the argument because my conclusions are consistent with its implicit and explicit premises. Most would have thought that commendable *logic*, especially when (as Patz complains) those premises were restrictive, not loose, not all-encompassing and the like.

Finally, five examples of the *straw man fallacy* are presented: the *contradiction straw man*, with respect to which I am accused of ignoring explicitly signposted distinctions in Patz 1977. That they were not pursued does not imply, nor support his inference, that they were ignored. His logic *is* at fault there! There was no good reason to pursue what had been rejected. The *goods and services straw man*: this gains attention because it refers to factors which make the price structures in different countries non-comparable and purchasing power parities unlikely to equate with actual exchange rates. Agreed, it is a straw man for Patz's PPTT case, for which I was not arguing, but it is not for my CoCoA/ER case for which I was! The matter of the *calculation propriety straw man* is unclear. But the *surrogation straw man* and the *medium of exchange straw man* are clear enough. With respect to the former, despite Patz's protestations, a substantial case has been mounted in monetary economics for purchasing power parities as surrogates for exchange rates, not (as he implies that I suggest) because exchange rates are unavailable, but because purchasing power parities are perceived to capture better the rates at which currency exchanges ought to take place.

With respect to the *medium of exchange straw man* I am seriously misrepresented. Again, the setting is my rejection of the importance Patz gives his notion of place significance. My discussion of the exchange property of money is lampooned by recourse to a grossly inaccurate quotation. I am supposed to have implied (by virtue of the syntax of the quote as Patz misrepresents it) that *yard and metre sticks are alternative media of exchange.* 'Using metre sticks as a medium of exchange is a novel idea, but not one in PPTT', Patz says (p. 246). Neither is it in my argument. His support for implying that it is comes, disturbingly, from his exclusion of the final three words '. . . for measuring height', from my 1978 statement. The canons of academic criticism demand a better performance than that!

A denial of the antecedent?

No evidence of fault in the logical connections between my 1978 premises and conclusion of *CoCoA/ER*, emerges from Patz's comminatory remarks. On the contrary, he quite clearly finds the home for his objections and complaints outside my CoCoA framework, outside my Nirvana as he calls it. To make his point he frequently steps *outside Nirvana*: he pleads his framework to be (in contrast with mine) a quite different *comparative institutions* approach (p. 241); quoting Demsetz he reproduces 'Given the Nirvana view . . .' (p. 242); and declares 'Outside Nirvana . . .' to press his complaint (p. 242), and likewise by stepping 'Beyond Nirvana' (p. 243), contrasts the 'ideal' and the 'real' (p. 241), and then he contrasts Nirvana with 'extant preferences' (p. 242) and with 'real world translation' (p. 245). Furthermore, his descriptions of the *Whole* and *Hole* fallacies (especially the latter) draw explicitly upon the logical validity of the CoCoA origins of my (*too restrictive*, he says) argument.

Note that Professor Patz's complaint is that the logic of CoCoA is too tight; no pointing by Patz to logical fallacies there; no *ignoratio elenchi*, no *post hoc ergo propter hoc*, no *non causa pro causa*, no *secundum adjacentis*, or the like. His complaint appears to be sourced in his dislike for the framework in which I chose to present an argument contrary to his for PPTT. That is a problem for him, but not for me!

References

Abdel-Magid, Moustafa F., 'Towards a Better Understanding of the Role of Measurement in Accounting', *Accounting Review*, April, 1979, pp. 346–357.

Clarke, Frank L., 'Patz on Parities, Exchange Rates and Translation', *Accounting and Business Research*, Winter, 1978, pp. 73–77.

Demsetz, Harold, 'Information and Efficiency: Another Viewpoint', *Journal of Law and Economics*, April, 1969, pp. 1–22.

Patz, Dennis H., 'Alternative Realities and Price Parity Translation', *Accounting and Business Research*, Summer, 1988, pp. 239–247.

ACCOUNTING AND FINANCE

Vol. 29 **No. 2** **November 1989**

"Accounting and Finance": Statistics

FINANCIAL STATEMENT USERS' PERCEPTIONS OF FACTORS AFFECTING THE ABILITY OF AUDITORS TO RESIST CLIENT PRESSURE IN A CONFLICT SITUATION
Daryl Lindsay

EVALUATING THE PERFORMANCE OF EMPLOYEES OF CHARTERED ACCOUNTING FIRMS IN AUSTRALIA
C. G. Peirson, R. Simnett and J. H. Pratt

COVENANTS IN U.S. PUBLIC DEBT AGREEMENTS
Jennifer Francis

COMPANY PARTICIPATION IN THE AUSTRALIAN ACCOUNTING STANDARDS SETTING PROCESS
John Gavens, Garry D. Carnegie and Robert W. Gibson

ESTIMATING RETURNS ON FINANCIAL INSTRUMENTS—DETERMINISTIC ANALYSIS
Gary Kelly and Mark Tippett

INVESTMENT DECISION CRITERIA USED BY LISTED NEW ZEALAND COMPANIES
Cleveland S. Patterson

EDUCATION NOTES

FACTORS INFLUENCING CHOICE OF DISCIPLINE OF STUDY—ACCOUNTANCY, ENGINEERING, LAW AND MEDICINE
F. A. Gul, B. H. Andrew, S. C. Leong and Z. Ismail

BOOK REVIEWS

"Accounting and Finance": Referees Reports Received

Copyright

© 1989 by The Accounting Association of Australia and New Zealand.
The object of *Accounting and Finance* is to promote the wide dissemination of the results of research and other scholarly inquiries. Permission is hereby granted to reproduce any of the contents of *Accounting and Finance* for use in courses of instruction, so long as the source and the Accounting Association of Australia and New Zealand copyright are indicated in any such reproductions. Written applications must be made to the editor for permission to reproduce any of the contents of the Journal for use in other than courses of instruction—*e.g.*, inclusion in books of readings or in other publications intended for general distribution. In consideration for the grant of permission by the Journal in such instances, the applicant must notify the author(s) in writing of the intended use to be made of each reproduction. Except where otherwise noted in articles, the copyright interest has been transferred to the Accounting Association of Australia and New Zealand. Where the author(s) has (have) not transferred the copyright to the Association, applicants must seek permission to reproduce (for all purposes) directly from the author(s). These conditions apply to all articles published in *Accounting and Finance* and its predecessor journal *Accounting Education* from Volume 1.

ACCOUNTING AND FINANCE is published twice yearly in May and November by the Accounting Association of Australia and New Zealand. The membership fee is $28 per year and members receive the journal and any published supplement. Non members, i.e. libraries etc., can take out a subscription for the journal for $40 per year. Editorial correspondence should be addressed to Professor F. J. Finn, Editor, Department of Commerce, University of Queensland, St. Lucia, Queensland, 4067, Australia. Applications for membership should be addressed to The A.A.A.N.Z., c/- Department of Commerce, University of Queensland, St. Lucia, Queensland, 4067.

ISSN: 0810–5391

Book Reviews

Financial Accounting: Meaning and Method. *Richard Laughlin and Rob Gray.* VNR International, 1988. xxii + 536 pp.

The ideal review of a textbook—particularly an introductory textbook—would be written after a minimum of, say, two years' experience of classroom use and would include extensive student feedback. However, your editor is insisting on a rather tighter timetable, so here is a timely—if unreliable—report.

The first thing that strikes one on skimming through the volume is that, if students lose their way in it, it will not be for lack of effort on the authors' part: there are diagrams showing how the subject matter of the book relates to others in the series and how each chapter relates to the rest of the book; each of the parts into which the book is divided has an introduction and overview; each chapter has a statement of learning objectives, a summary and a list of key terms and concepts; a chapter summarises the book by describing 'pathways' *it* has covered and indicates further pathways which could be covered on advanced courses; and the final third of the volume is a 'workbook' carefully keyed to the text proper.

The authors aim to go beyond the usual coverage of introductory texts by (a) setting the financial accounting process in its organisational context, (b) offering critical and analytical perspectives and (c) covering not-for-profit as well as profit-seeking organisations. They seek to achieve (a) and (b) by showing how financial statements capture only a limited range of the elements of 'organisational reality' (a useful term in an introductory text even if philosophers might baulk at it) and how incorporating other elements might alter financial statements. These objectives are realised to some degree, but the need to provide students with a sound knowledge of the accounting process as presently constituted means that much of the book looks fairly orthodox: icons are broken in the margin, as it were.

As an example, consider the coverage of inventory valuation. A clear and very well presented exposition of the mechanics of the process concludes rather lamely:

> the next question is whether any of these approaches is more accurate or appropriate than any of the others. The simple answer is 'no' because all of the approaches are, to an extent, arbitrary with strengths and weaknesses which can be assessed in different ways. For instance, FIFO provides a much more realistic inventory valuation in inflationary times.... In the end no one approach stands out against the rest and therefore some decision on appropriateness, based on a not altogether clear rationale, has to be taken.... (p. 116)

The reluctance to be too unorthodox is not to be taken as a severe criticism, however: a textbook which ignores the 'organisational reality' of accounting departments would be of little value.

The authors' concern to set out the argument as clearly, cogently and comprehensively as possible sometimes produces an exposition which is baroque to the point at which the abler student might actually be put off. It certainly produces some elaborate headings; that for section 4.5 for example is 'an amplification of the account which records operations sub-system movements' (p. 81).

On the whole, though, this is a useful addition to the range of introductory texts, with a clear, well-thought out presentation of the mechanics of the financial accounting process and more critical material than is found in most such texts.

I have one niggling criticism: to be levied, no doubt, at the publishers rather than the authors. The inclusion on the cover of the book of laudatory 'pre-publication comments', *quoted anonymously*, is unpersuasive as a marketing ploy. One pre-publication reader thought this book review, 'quite the most scintillating accounting essay to come out in a decade', but as the reader in question was your reviewer's mother, our editor will not be doubling the print run.

University of Kent
at Canterbury

Brian A Rutherford

Auditing Symposium IX. Proceedings of the 1988 Touche Ross/University of Kansas Symposium on Auditing Problems. *Rajendra P. Srivastava* and *James E. Rebele* (*eds*), The University of Kansas, School of Business.

This volume is the ninth in an excellent series of collected proceedings taken from auditing symposia supported by Touche Ross. This edition of the series comprises eight articles written by some of the most able researchers in the field of auditing; seven of the eight have discussants' responses.

The first paper 'Using and evaluating audit decision aids' by Robert H. Ashton and John J. Willingham covers a broad canvas, looking at those types of auditor decision aid linked to the body of research known as human information processing (HIP) or behavioural decision theory which are designed to assist auditors in making decisions required in the collection and evaluation of audit evidence. The paper concludes that there is a role for decision aids, but confirms that they need a cost-benefit justification. The paper first attempts to address the issue of whether to use decision aids or to improve the training of auditors to improve their decision making abilities. It then goes on to examine the various claims made by developers and proponents of such aids. The next issue the paper addresses is the problem of validation. Finally the paper outlines some of the possible long term effects on the audit firm and the individual auditor of the employment of decision aids.

The second paper examines the search for auditing's Holy Grail. The author, Jack C. Robertson, puts it slightly differently: 'The goal of this paper is to present several candidates for the theory of auditing'. The author rightly states that in the paper there is 'no pretension to formulate a "new" audit theory'. The first section of the paper provides some examples of areas of literature that offer possible contributions to a theory of auditing. As this section highlights, a major problem of the development of an auditing theory is to ensure that the theory remains focussed on auditing. This is not a problem which is unique in the social sciences, where subject areas tend to overlap. For example auditing clearly contains elements of economics, sociology, systems theory, etc. The most interesting aspect of the paper to this reviewer was the distinction made towards the end of the paper between 'macrotheory' and 'microtheory' in auditing, the former being an all encompassing 'theory of everything' and the latter a series of tools useful in practice.

Initially my reaction to the discussant's response to this paper was to sympathise with my fellow academic, the paper's author. This was the most 'theoretical' paper in the series, and thus possibly the most divorced from practice. Therefore, the discussant's reaction was not totally unexpected. His comment amounted to: 'I don't understand this paper or many of the terms used in it and nor would most practising accountants'. For the development of auditing research, this was one of the most important sections in the whole book, for it stressed the need for academics to communicate effectively with their practitioner brethren.

Jerry D. Sullivan's paper 'Why the auditing standards on evaluating internal control needed to be replaced' considers SAS No. 55, Consideration of the Internal Control Structure in a Financial Statement Audit, which replaces section 320 or SAS No. 1. The paper cites the observation that a disproportionately high percentage of audit performance problems arise from the evaluation of a client's internal control structure. Sullivan concludes that the new standard will establish a framework which will enhance audit quality and the public perception of auditor performance and thus lessen the well known 'expectation gap' between auditor and auditee.

The fourth paper, 'Auditor's Assistant: A knowledge engineering tool for audit decisions', by Glenn Shafer, Prakash P. Shenoy and Rajendra P. Srivastava is very heavy on maths. Unfortunately the complexity of concepts such as internal control are not so easily captured. It has near the beginning a sentence that has become very familiar to me since I started reading articles on the development of expert systems in auditing: 'The system when fully developed, should enable its users [(auditors)] to. . .'. Regrettably, in spite of the correct assertions in the paper that 'it is believed that such systems will facilitate audit decisions', and 'accounting firms are committing increasingly greater resources to developing such systems', very few papers begin: 'This paper describes an expert system that improves audit decisions'. In defence of both the paper and auditing expert systems, I am reminded of Benjamin Franklin's comment, when Franklin and a friend witnessed the Montgolfier Brothers' hot air balloon. Franklin's companion remarked 'what possible use is it?', to which the great man replied 'of what possible use is a babe in arms?'. To develop useful systems we must create 'noble attempts' first.

James A. Johnson of Touche Ross & Co. in the fifth paper provides us with a review of the operation of SAS 50, Reports on the Application of Accounting Principles. The paper also discusses the reasons why financial intermediaries and other 'non-auditing' clients ask CPAs for reports on the application of accounting principles.

'Auditor evidential planning judgements' is the title of Arnold Wright's and Theodore J. Mock's study which makes up the sixth paper. It examines the evidential planning decisions of 21 experienced auditors in an experimental setting. The analytical hierarchy process is employed to good effect to investigate explicitly the multi-attribute trade-offs made in such judgements. A significant finding of the study was that, although auditors were in near agreement as to the comparative importance of various evidential criteria, there was not a strong consensus in applying those criteria to evaluate the merits of alternative procedures or in planning the allocation of hours.

The seventh paper is intriguingly entitled 'The relative importance of auditing to the accounting profession: is auditing a profit center?' The authors, Norman R. Walker and Michael D. Doll, have written a paper which refers to certain aggregated financial, statistical, and other information relating to the US operations of what used to be the Big Eight firms. Their examination mainly looks at the accounting and auditing components. The paper concludes that, in spite of an increasingly competitive environment, auditing continues to be a viable, desirable and necessary business activity for accounting firms and provides a rewarding and challenging career path.

The final paper, 'Accounting standards and professional ethics' by Arthur R. Wyatt is an interesting investigation of a current concern in the USA that 'professional' accountants spend much of their time approaching the application of accounting standards with the objective of seeking out and exploiting loopholes. The author concludes that unless the profession puts its own house in order and undertakes various initiatives, outside bodies will do so.

Exeter University B. J. Spaul

Case Studies in Management Accounting and accompanying Instructor's Manual. *D. Otley, D. Brown and C. Wilkinson (eds.).* Philip Allan, 1988. x + 227 pp. and 209 pp. £45.

This book of case studies, and its companion Instructor's Manual, have been assembled from an array of academics and teachers who, with one exception, are based in the UK. The context for the selection process, and the purpose of the book, is to supply good case study material: that being material which provides students with some appreciation of management accounting in action. This reviewer thinks the book certainly has achieved that purpose.

In fact the existence of the book does more than just this. The production and public dissemination of this type of educational material is a position statement about certain facets of management accounting. Not only is it a statement about educational processes and the apparent difficulties associated with the craft of teaching management accounting, but also about the condition of some of the notions that currently underpin management accounting.

For a long time, this teacher has voiced serious misgivings to his students about the quantitative approaches that are to be found in most accounting texts and cautioned against the mindless mechanistic application of these in practice. This is because the immediate work environment of organisations does not lend itself to a simple application of a bag, a box or even a computer full of quantitative techniques. This book is not for teachers whose sole preoccupation is with the application of formulae to numbers.

The book's quality lies in the content of the cases. Some of the cases are taken from events which have actually taken place. The remaining cases are contrived situations, and generally these stand out. The distinction between the two groups has nothing to do with any particular contributor as such, but is related to the quality of the material presented. Although there is no way for the reader to know the derivation of all of the cases, it would appear that those based on actual events generally contain a richness, a 'feel' about the texture of the narrative, and issues of detail and relevance that hang together as the fabric of organisational life unfolds in the case. For case purposes they have probably been refined.

Those who have criticised the teaching of management accounting as being bland and taught through the experiences of industrial life, which has generally been perceived as an engineering company in the heart of the Midlands, will be delighted with this collection. The cases cover a variety of settings. Set in an electronics company, one case pursues the role and function of management accounting, whilst others provide the scenario to discuss the implications of accounting information systems design either in an international cosmetics company or a multinational chemical concern.

Students can take off with the product launch of a new range of ready-cooked meals. Then they are brought down to earth with the issue of research and development which is found most distinctly in two cases, one about making fertilisers and pesticides, the other concerning the research arm of a seed company. Budgeting can be found in a number of cases such as the companies making moulded cabinets, electrical goods, paper, and motor components, as well as a local authority. Standard costing appears in several contexts including companies producing computers and electronic control systems.

A charity is the setting for one financial crisis, whilst the nineteenth hole is a focus of the crisis at a Highlands' golf club, but not to be outdone a general engineering company has its problems too. In calmer moments it is possible to ponder the structures of systems in a multisite surveyors, centralisation in supermarkets, the multinational machinations of an oil company, profit-related pay in pharmaceuticals and the audit of capital expenditure in the construction industry.

There also are all of those issues which have been constantly with us. The basic rationality for human activity is exemplified in the coal industry, cost allocation curdles in a dairy, there is pricing of domestic cleaners, opportunity costs of contracts in an engineering group, process costing in the chemical industry, regression analysis in double glazing systems, the needle of divisional performance in the division of one company and the transfer pricing of rubber hose in another.

Amongst the 39 cases there is one set which stand out from the others. This is a series of 4 cases from Tony Berry of Manchester Business School which have been adapted from his work with the operating unit of an international textile and clothing company. The cases lead the reader through the financial history of the unit to an analysis of the performance of product groups, forecasting, cost control, break even analysis and into the control and reporting functions.

There is evidence that the conventional accounting text and practice of management accounting are not the same. It may seem churlish to mention, but the only serious complaint I would make against the advice proffered in the Manual is that which suggests that the best solution to one problem is to introduce accountants with knowledge of similar industries elsewhere! There is evidence that management accountants are not masters of the management accounting system in their organisation, for accounting is a political issue, and yet this does not come through in the cases and rarely comes through in the Instructor's Manual. Perhaps such organisational conditions are accepted as 'givens' by the authors. The only reference to political issues in the editors' index is the local authority case study which is classed as a political decision. Equally surprising is the apparent absence of any reference to power in any form within organisations by any of the contributors. This book is saturated with issues of planning and control and yet Berry's cases are the only ones noted as containing such material by the editors' index. However, as the debate about management accounting continues, its teaching will be enhanced by the existence and use of this book.

University of Reading Derek E. Purdy

The Evolution of Selected Annual Corporate Financial Reporting Practices in Canada 1900–1970. *George J. Murphy.* Garland Publishing, 1988, ix + 221 pp. $35.

The book is based on a doctoral dissertation completed by Murphy at Michigan State University in 1970. We are told that the book is reproduced in substantially its original form, subject to some relatively minor corrections and re-interpretations of factual data in order to clarify portions of the text and make it generally more readable. It is a pity that the opportunity was not taken to add an index.

The book is divided into five sections: Chapter I covers the purpose, background, and scope and methods of enquiry; Chapter II deals with the evolution of mandatory audit and the content of the auditors' standard certificate; Chapters III–V cover the evolution of the balance sheet and the profit statement: Chapter VI examines the evolution of corporate depreciation practices; and Chapter VII summarises Murphy's findings and conclusions. Within each chapter the material is handled on a chronological basis.

The financial statements used for the first 40 years of this study are taken from *The Annual Financial Review—Canadian* which, for these years, reproduced the financial statements published by over half the companies listed on the Toronto Stock Exchange. For 1940–70 the data are taken directly from company reports, with a sample of ten reports for each year. In addition, the author carried out 'test readings' of the reporting practices of 30/40 companies at ten yearly intervals throughout the period (the companies examined are listed in Tables 1 and 2 which appear to have been erroneously omitted from the Appendix). The observed practices are related to Canadian State legislation and that enacted by the State of Ontario.

The study also identifies major environmental influences, both internal and external (namely the US and Britain), on the development of procedures using relevant legislation, debates of the House of Commons and the Senate, relevant government committee reports, financial press, commentary, stock exchange requirements, accountancy text books, professional periodicals and professional pronouncements. Outside Canàda the main journals consulted are *The Accountant*, *The Journal of Accountancy* and *The Accounting Review*. A large portion of the text consists of extracts from text books, committee reports, and Acts of Parliament. The companies covered are 'industrials' other than banks, insurance companies, railroads, utilities and trust and loan companies, on the grounds that these are the subject of separate legislation.

The purpose of the book is 'to sketch in broad perspective the changes and influences that have taken place' (p. 9). The absence of already existing detailed studies to form the basis of the history is acknowledged, and Murphy's aim is to provide a framework which identifies topics that appear to be the most fruitful for further and more detailed investigation. In my view, Murphy undoubtedly achieves his objective though, so far as I am aware, little attempt has been made to examine further his findings, and our knowledge of the development of Canadian financial reporting procedures remains a structure without a core.

The statutory basis for Murphy's text is the Canadian federal legislation, relating to accounting matters, enacted in 1917, 1934 and 1964–5. The first and last of these enactments followed, with roughly a ten year gap, broadly similar legislation introduced for the state of Ontario in 1907 and 1953. The state legislation was, in turn, based on the recommendations of the Institute of Chartered Accountants of Ontario, although it is acknowledged that the British Companies Act 1900 formed the blueprint for the audit provisions contained in the first set of proposals.

The disclosure requirements contained in the 1907 and 1917 Acts were, however, significantly in advance of those contained even in the British Companies Act 1928; in the US, they were not matched until the passage of the Securities Acts 1933–4. The discrepancy between British and Canadian statutory disclosure requirements was further increased in 1934, by which time companies were required to list a fairly full range of balance sheet items, certain profit and loss account details, to reconcile movements on reserves, specify methods of valuing stocks, debtors and fixed assets, and encouraged to publish consolidated financial statements. In Britain most of these requirements were not introduced until 1948. Murphy attributes the marked difference between the British Act of 1928 and the Canadian Act of six years later to revelations in the Royal Mail Case, which was closely followed in the press, rather than the US stock market crash.

In very broad terms, the nature of Canadian legislation and corporate disclosure practices, between 1900 and 1970, seems not dissimilar from British developments. The path of change is seen 'as a somewhat slow, evolutionary one' (p. 155), with legislative requirements based on the concept of 'minimum disclosure'. Moreover, in both countries the aim has been to achieve a general levelling up of standards; a difference is that the Canadian Acts gave legislative effect to what was regarded as the very best practices, which only the 1948 Act did in this country. A further interesting contrast with the UK has been the possibility of using State Legislation as a testing ground for federal legislation.

From about the 1930s Murphy discerns a movement away from British influence and towards that of the US. Important factors bringing about this change are considered to be close geographic proximity to the US and the massive increase in the level of trading activity with, and investment by, that country compared with the UK (the percentage shares of non-resident investment in Canada in 1900—14% by US compared with 85% by the UK—was almost exactly reversed by 1966). Further developments leading to a growing US influence were the fact that many Canadian corporations were subsidiaries of US parent corporations while most of the large Canadian public accounting firms were, by the early 1930s, affiliated, or soon to become affiliated, to US professional accounting firms.

Following the issue of its first recommendation, in 1946, the Canadian Institute of Chartered Accountants increasingly became, according to Murphy, the acknowledged leader of the Canadian accounting profession, with 'almost all of the existing legislation relating to financial statement disclosure a direct copy of [its] recommendations' (p. 137). An examination of developments since 1970 show this to be a continuing process. In 1975 the Canadian government formally delegated the power to issue new financial reporting regulations to the Institute's Accounting Research Committee.

Cardiff Business School J. R. Edwards

the
ACCOUNTING
REVIEW

Quarterly Journal
of the
American Accounting Association

Managing Editor and Editor
WILLIAM R. KINNEY, JR.
University of Texas at Austin

Editors
ROBERT LIBBY
Cornell University
ROBERT P. MAGEE
Northwestern University
GERALD L. SALAMON
Indiana University

Consulting Editors
JOEL S. DEMSKI
Yale University
ROBERT W. HOLTHAUSEN
University of Chicago

VOL. LXIV OCTOBER 1989 No. 4

Main Articles

Did Firms Undertake Debt-Equity Swaps for an Accounting Paper Profit or True Financial Gain? JOHN R. M. HAND
The Nature and Amount of Information in Cash Flows and Accruals VICTOR L. BERNARD and THOMAS L. STOBER
Auditors' Confidence in Recognition of Audit Evidence CINDY L. MOECKEL and R. DAVID PLUMLEE
Selection of GAAP or RAP in the Savings and Loan Industry JOHN W. HILL and ROBERT W. INGRAM
Security Price Response to Quarterly Earnings Announcements and Analysts' Forecast Revisions BRADFORD CORNELL and WAYNE R. LANDSMAN

Notes

Auditor Reputation and the Pricing of Initial Public Offerings RANDOLPH P. BEATTY
Identifying Audit Adjustments with Attention-Directing Procedures ARNOLD WRIGHT and ROBERT H. ASHTON
Expert Measurement and Mechanical Combination in Control Reliance Decisions ROBERT LIBBY and PATRICIA A. LIBBY
Predisclosure Information Search Incentives, Analyst Following, and Earnings Announcement Price Response STEPHEN J. DEMPSEY
Selection of Short-Term Accounting-Based Bonus Plans HARRY A. NEWMAN
Unusual Patterns in Reported Earnings JACOB K. THOMAS

Accounting and Business Research

Accounting and Business Research

Editors:
C. W. Nobes, University of Reading
R. H. Parker, University of Exeter

Board of Editorial Referees
J. Arnold, University of Manchester
P. W. Bell, Rice University
A. M. Bourn, University of Southampton
M. Bromwich, London School of Economics
P. Brown, University of Western Australia
D. A. Burgstahler, University of Washington
D. J. Cooper, University of Alberta
D. A. Egginton, University of Bristol
M. Firth, University of Colorado at Denver
J. Flower, Commission of the European Communities
T. A. Lee, University of Edinburgh
R. Ma, Sydney
G. B. Mitchell, Institute of Chartered Accountants in England and Wales
R. C. Morris, University of Liverpool
D. T. Otley, University of Lancaster
J. M. Renshall, Peat Marwick McLintock
L. Revsine, Northwestern University
J. M. Samuels, University of Birmingham
D. Simunic, University of British Columbia
L. C. L. Skerratt, University of Manchester
D. Solomons, University of Pennsylvania
C. R. Tomkins, University of Bath
D. P. Tweedie, Peat Marwick McLintock and University of Bristol
M. Walker, University of Manchester
G. Whittington, University of Cambridge
G. Whittred, University of New South Wales
B. S. Yamey, London School of Economics
S. A. Zeff, Rice University

Editorial Office:
Prof. R. H. Parker, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK. Tel: 0392 263209

Advertisement and Subscription Office:
40 Bernard Street, London WC1N 1LD, UK. Tel: 071 628 7060

The Institute of Chartered Accountants in England and Wales

Incorporated by Royal Charter, 11 May 1880

President

Philip Couse

Secretary:
John Warne

Institute Offices and Library:
Chartered Accountants' Hall, Moorgate Place, London EC24 6EQ. Tel: 071 628 7060

The views expressed in *Accounting and Business Research* are not necessarily shared by the Council of the Institute of Chartered Accountants in England and Wales. Articles in *Accounting and Business Research* are published without responsibility on the part of publishers or authors for loss occasioned to any person acting or refraining from action as a result of any view expressed therein.

© 1990 The Institute of Chartered Accountants in England and Wales.

ISSN 0001-4788

Accounting and Business Research
Volume 20 Number 79 Summer 1990

Contents

The Leasing Decision: A Comparison of Theory and Practice	Colin Drury Steven Braund	179
Towards Some Principles for Intangible Asset Accounting	Don. A. Egginton	193
The Management of Currency Risk: Case Studies of US and UK Multinationals	P. Collier E. W. Davis J. B. Coates S. G. Longden	206
Managerial Accounting Early in the British Industrial Revolution: The Carron Company, a Case Study	Richard K. Fleischman Lee D. Parker	211
The Share Investment Decision Process and Information Use: An Exploratory Case Study	G. Gniewosz	223
Positive Accounting Theory as a Lakatosian Research Programme	Tom Mouck	231
A Note on the Disclosure Size Exemptions in Technical Release 706	Michael J. Mumford	240
Towards a Comprehensive Accounting for Convertible Debt	Derek E. Purdy	245
The Reliability of Reported Profits and Asset Values, 1890–1914: Case Studies from the British Coal Industry	Judith Wale	253
Book Reviews		269

Bound Volumes of Accounting and Business Research

Bound volumes with index of Volume 8 1977–78 onwards are available from the Subscriptions Manager, Accounting and Business Research, 40 Bernard Street, London EC1N 1LD, England.
Subscribers wishing to have their own copies bound should address their enquiries to Messrs. George Woodhead and Co., 1 Gloucester Street, Manchester M1 5GP, England.
Microfilmed copies of back numbers are available from Microfilm Ltd., East Ardsley, Wakefield, West Yorkshire WF3 2AT, England.

Subscription Rates

	UK	Overseas	Overseas Airmail
Individual	£22	£24	£29
Student	£11	£12	£17
Corporate/institutional	£32	£33	£38

All Subscriptions may be paid in US dollars at current rates of exchange.

ABR 20/79—A

CALCUTTA CENTRAL LIBRARY

Forthcoming Articles

M. Benne, M. Kerremans, H. Theunisse and G. Van Overloop, Cost Accounting in Manufacturing Companies: Some Belgian Empirical Evidence.

P. A. Collier, G. R. Kaye, B. J. Spaul and B. C. Williams, The Use of Computers in Accountancy Courses: A New Perspective—A Comment.

Istemi S. Demirag, Multinational Performance Measures and their Association with Contextual Variables.

S. Eckl and J. N. Robinson, Some Issues in Corporate Hedging Policy.

E. A. French, The Origin of General Limited Liability in the United Kingdom.

Brian Gibson, Determining Meaningful Sales Relational (Mix) Variances.

T. A. Lee, Restricting the Domain and Potential of Cash Flow Accounting.

Rifaat Ahmed Abdel Karim, Standard Setting for the Financial Reporting of Religious Business Organizations: The Case of Islamic Banks.

Kevin Keasey and Helen Short, The Accounting Burdens Facing Small Firms: An Empirical Research Note.

Bill McInnes, A Longitudinal Study of Accounting Changes: The UK Gas Industry, 1969–1974.

G. W. Radcliffe, Accounting Standards and the Judiciary.

Peter E. M. Standish, Origins of the Plan Comptable Général: A Study in Cultural Intrusion and Reaction.

Walter Taplin Prize

The British Accounting Association and Accounting and Business Research offer a prize of £100 for the best article published in each annual volume. The prize is named in honour of the journal's founding editor, the late Walter Taplin. The prize relating to Volume 19 (1988/89) was awarded to Don Egginton, John Forker and Mark Tippett for their paper on 'Share Option Rewards and Managerial Performance: An Abnormal Performance Index Model' which was published in the Summer 1989 issue.

Reproduction Policy

Permission is hereby granted to reproduce without charge any article in this issue of Accounting and Business Research for use in courses of instruction provided that the source and the author's copyright are indicated in such reproduction.

Objective of Accounting and Business Research

The objective of Accounting and Business Research is the publication of substantial and original contributions to knowledge in the areas of accounting and finance, broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

Accounting and Business Research, Vol. 20, No. 79, pp. 179–191, 1990

The Leasing Decision: A Comparison of Theory and Practice

Colin Drury and Steven Braund*

Abstract—The UK leasing industry has grown dramatically in the 1980s. The academic literature suggests that there are two major reasons for leasing—taxation benefits and off-balance sheet financing. Recently taxation and financial reporting changes have substantially reduced the taxation and off-balance sheet financing benefits from leasing. Against this background a postal questionnaire survey of the opinions of UK financial managers on various issues relating to finance leases was undertaken. This paper reports on the findings of the questionnaire survey. A distinguishing feature of the survey is that the replies were analysed by various financial characteristics of the responding companies.

Introduction

This paper reports on the results of research involving a questionnaire survey of the opinions of a sample of UK financial managers on various issues relating to *finance* leases. The survey was undertaken between February and April 1987. The objectives of the research were to:

(1) determine the importance of various factors which influence the lease or purchase decision;
(2) examine the attitude of firms to the changes in the leasing environment resulting from the 1984 Finance Act and SSAP 21 and to obtain an indication of their future leasing activities;
(3) determine whether or not there was any relationship between the volume of leasing activity and various financial variables;
(4) ascertain how the lease or purchase decision is evaluated.

Lease valuation theory

Lease valuation models which are presented in financial management text books are based on the theory advocated by Myers, Dill and Bautista (1976). These models assume that firms do not have unlimited borrowing capacity and, because leasing commits a firm to a series of fixed payments, leasing is equivalent to borrowing. Therefore undertaking a leasing contract reduces a firm's borrowing capacity, and consequently leasing should be compared with borrowing.

The term 'Net Advantage to Leasing' (NAL) is used to describe the difference between the present value of leasing the asset and the present value of borrowing (or lending when calculating the lessor's NAL) and purchasing the asset. Where the lessor and lessee both pay taxes at the same rate, the cash inflow to the lessor from a lease contract will be equal to the lessee's cash outflow. Lease valuation theory also advocates that the lessor and lessee should discount the cash flows at the same interest rate, namely the lessor's lending rate. The justification for this is that the lessor is comparing the lease to an equivalent loan that may be granted to the lessee secured on the same asset. In effect this interest rate represents the lessor's opportunity interest cost from leasing the asset instead of lending. Similarly the lessee is comparing the lease with effectively the same loan obtainable from the lessor or another lender. Therefore in competitive markets both parties will use the same before tax interest rate, and the after tax interest rate will only differ if they are in different taxpaying positions. Where the lessor and lessee pay taxes at the same rate the negotiation of a leasing contract will lead to an agreement with either a zero NAL for both parties or a positive value for one party and a negative value for the other. In other words leasing appears to be a zero-sum game. However, if the lessee is a temporary non-taxpayer, the lessor can purchase the asset and take advantage of the depreciation tax shields at the earliest opportunity and pass on some of these benefits to the lessee in the form of reduced rentals. This tax asymmetry between the lessor and lessee enables both parties to negotiate a lease which has a positive NAL. Thus finance leasing ought to flourish in a climate where depreciation is accelerated for tax purposes

---

*Colin Drury is a reader in accountancy and finance at Huddersfield Polytechnic and Steven Braund is a lecturer in accountancy and finance at the University of Hull. The authors are indebted to the anonymous referees for their helpful comments and to the Chartered Institute of Management Accountants for funding this research.

Table 1
Leased assets acquired (1978–1988)

	£m	% of all UK investment
1978	1,214	7.9
1979	1,802	9.9
1980	2,359	12.1
1981	2,674	14.0
1982	2,834	13.2
1983	2,894	12.6
1984	4,012	15.2
1985	5,757	18.8
1986	5,182	16.5
1987	6,024	17.5
1988	7,836	20.2

and many companies are not paying corporate taxes.

The growth of UK leasing

Table 1 shows that the UK leasing industry has grown dramatically in the past decade. It would appear that much of this growth can be attributed to the pre-1984 tax system which permitted the entire capital cost of plant and machinery to be set off against taxable profits for the year in which the asset was purchased. Under this system it was estimated that more than 50% of UK publicly quoted companies found that their annual fixed asset acquisitions exceeded their taxable profits.[1] As a result, these companies could not absorb all of the capital allowance in the year of acquisition. Consequently the tax benefits from the capital allowances were delayed and their present value reduced. The leasing company (the lessor) is usually the subsidiary of a bank or other financial institution which has substantial taxable profits. The lessor can therefore obtain the tax benefits as they arise. The ability of the lessor to capture the capital allowances earlier than the lessee enabled both parties to gain from a leasing contract. However, the changes introduced by the 1984 Finance Act, which became fully effective in April 1986, substantially reduced the ability of both parties to gain from a leasing contract. During the period 1984–1986 the 100% first year allowance was phased out and replaced by 25% annual writing down allowances calculated on a reducing balance basis. In addition, the corporate tax rate was progressively reduced from 50% to 35%. The effect of these changes has been that from April 1986 it has become more likely that firms will be in a position to take advantage of capital allowances as they arise. The Institute of Fiscal Studies estimated that only 11.6% of UK companies would be non-taxpayers in 1988. Our study confirmed this, with only 9.6% of the firms indicating that they would not be paying mainstream corporation tax in 1988.

With the new taxation system fully phased in, and with the passing of the specially favourable impact of the transitional period, the taxation system no longer gave leasing a 'competitive edge' in terms of cost over other sources of debt finance. Leasing now competes with borrowing on more equal terms, but there are still no obvious disadvantages from financing asset acquisitions in this way. Without the advantages of accelerated capital allowances leasing has continued to grow. Alternative explanations, other than tax savings arising from accelerated capital allowances, must therefore be sought to explain the popularity of leasing.

Reasons for leasing

Taxpaying companies may choose leasing instead of alternative sources of finance for the following reasons:

(a) Timing differences due to the different accounting year-ends which enable the lessor to capture the depreciation tax shields earlier than the lessee.
(b) The lessor can borrow at a lower rate than the lessee.
(c) Equality of costs between leasing and borrowing.
(d) Lease finance can be obtained with greater ease and fewer restrictions.
(e) Leasing can provide off-balance sheet financing.
(f) Operating leases provide an important protection against the risk of obsolescence.
(g) Managerial motivations to lease for reasons of self interest.

The first two of the items listed above directly affect the NAL calculation and can enable NAL to be positive for both the lessor and lessee. Items (d) to (g) are *qualitative factors* which are not reflected in the NAL calculation.

Year-end Effect

In the UK, companies pay corporate taxes at dates varying from 9 to 21 months after the end of the financial year. Thus, if a taxpaying company incurred capital expenditure in the first month of the financial year, it would have to wait 21 months or more before the tax benefits could be obtained. Our discussions with lessors in the large ticket leasing market[2] indicated that they have established subsidiary companies so that within the group there is always one company with a financial year end within each quarter (or in some cases each month). Therefore the lessor will obtain the tax benefits between 9–12 months after the date of purchase, whereas the time lag could be 21 months or more if the lessee purchased the asset. In the large ticket market this timing difference can result in a significant increase in the present value of the depreciation tax shield.

---

[1] There is a great deal of evidence to suggest that tax exhaustion has been an important feature of the UK corporate tax system. Empirical evidence by Devereux and Mayer (1984) and Higson (1985) suggests that, during the period 1981 to 1983, more than half of UK publicly traded corporations had excess tax deductions and therefore can be described as tax exhausted.

Differential Interest Rates

Lease valuation models imply that in efficient and competitive capital markets the lessor and lessee would use the lessor's lending rate to calculate NAL. In effect the lending rate represents the opportunity cost to the lessor of leasing instead of lending. However, this rate is appropriate only if the lessor is faced with capital rationing and the demand for lending exceeds the supply of funds available to the lessor. If the leasing company has access to sufficient funds to undertake all profitable leasing or lending opportunities, it is appropriate to use the borrowing rate rather than the lending rate to evaluate the lease. The objective of the leasing company should be to negotiate a lending or lease financial agreement on the most favourable terms it can agree with a customer. The lessor would clearly wish to negotiate a leasing agreement with an implicit interest rate which was at least equivalent to the lending rate, but if this is not possible then any business which is in excess of the lessor's after tax borrowing rate will be profitable.

A leasing company may consider that leasing is less risky than financing a loan. In this situation the required rate of return on the lease ought to be less than the return required on a loan because of the lower risk. A leasing company may attach lower risk to leasing because it retains legal ownership of the asset if it is leased. This can provide better security for a lessor than a mortgage or charge arising from a loan. Whenever situations exist where it is appropriate for the lessor and lessee to use different interest rates to calculate NAL then both parties can gain from the leasing contract. This is perhaps most true for small company leasing where the lessee is using the better borrowing capacity/credit rating of the lessor to finance the purchase of an asset.

Equality of Costs Between Leasing and Borrowing

We have described a number of situations where NAL can be positive for both the lessor and lessee. However, if both parties use the lessor's lending rate to calculate NAL, then it may still be perfectly rational to negotiate a leasing contract with a zero NAL. Assuming that all other qualitative factors are held constant, a zero NAL derived from using the lease valuation model outlined in the preceding section implies that:

(1) the leasing company obtains the same return from the leasing contract as it would from lending;
(2) the cost of leasing of the lessee is identical to the cost of borrowing.

There are no obvious reasons why a firm should not lease if leasing is not more expensive than borrowing. There are other important factors which are not captured in the NAL calculation. Indeed, when these qualitative factors are taken into account, it may be rational for firms to undertake a leasing contract which has a negative NAL.

Greater Ease and Fewer Restrictions

Young companies which do not have an established track record or companies which cannot provide security for loan finance may find it difficult to obtain finance for new asset acquisitions. Financial institutions and banks may be reluctant to lend to these companies because of their inability to provide security. Instead, finance companies might be prepared to provide lease finance because security is provided in the ownership of the asset which remains with the lessor. From the lessee's point of view lease finance might thus be easier to obtain than borrowed funds and any restrictions imposed by borrowing might be avoided because the lessor retains security via the ownership of the asset. When a company borrows, the loan agreement may contain restrictive clauses on future borrowing. Thus leasing may be seen as a way to circumvent restrictive covenants.

Off-balance Sheet Financing

Evidence available from UK studies by Fawthrop and Terry (1975) and Sykes (1976) suggests that lease finance is often chosen because of its off-balance sheet characteristics. It may seem unlikely that sophisticated financial analysts would be fooled by off-balance sheet financing, but there is evidence (see Abdel-Khalik, 1981; Wilkins and Zimmer, 1983), that such things do occur. Even if financial analysts are not fooled by off-balance sheet financing, firms will still continue to lease because of the off-balance sheet characteristics if they think the market can be misled or if restrictive debt covenants are tied to balance sheet ratios.

---

[2] Large ticket leases refer to those leases in which the capital cost of the lease is very large.

The introduction of SSAP21 has resulted in the loss of the potential advantage of off-balance sheet financing in respect of finance leases. Nevertheless there is no positive disadvantage in terms of financial reporting requirements from financing asset acquisitions with finance leases instead of borrowing. SSAP21 does not require operating leases to be capitalised, and this has led to speculation that some firms will seek to restructure finance leases as operating leases.

Lease valuation models assume that lease finance displaces an equivalent amount of borrowing capacity. However, surveys by Sykes (1976) and Fawthrop and Terry (1975) have indicated that many financial directors consider that leasing reduces borrowing capacity by a smaller amount than an equivalent loan. This would suggest that the potential total borrowing capacity available to a firm could be increased by including leasing in the capital structure.

Protection Against the Risk of Obsolescence

Many leases enable the lessee to terminate the leasing contract after a short period, and without having to make sufficient rental payments to cover the cost of the asset. Leases of this kind are called operating leases. Where the economic life of equipment is uncertain, an operating lease can provide an important protection against the risk of obsolescence. In effect the lessee transfers the risk of obsolescence to the lessor. However, the rental payments will be higher to reflect the additional risk which the lessor bears on behalf of the lessee. With finance leases the lessee bears the risk of obsolescence.

Managerial Motivation for Leasing

The performance evaluation system may encourage managers to choose leasing for reasons of self-interest and this can result in dysfunctional consequences for the organisation. Leases may be arranged so that the payments in the early years are less than depreciation plus interest charges which would arise under the buy and borrow alternative. Such beneficial effects on short-term performance measures arising from leasing may motivate managers to lease even when NAL is negative. Dysfunctional consequences can also occur where firms do not capitalise finance leases for divisional performance evaluation. Where this occurs there is a danger that managers will lease purely because of the beneficial effects it can have on the divisional return on investment calculation. In some organisations leasing proposals may not be scrutinised as carefully as capital expenditure proposals. Thus managers may be motivated to circumvent capital expenditure controls by leasing.

Previous empirical studies

Surveys in the UK (Fawthrop and Terry, 1975; Sykes, 1976; Hull and Hubbard, 1979; Tomkins *et al.*, 1979) and USA (Anderson and Martin, 1977; Ferrara, Thies and Dirsmith, 1980; Anderson and Bird, 1980) tend to indicate that companies attach less importance than theory would suggest to taxation factors. It would appear from the surveys that the most important reasons for leasing are that it conserves cash flows and provides a source of funds which does not utilise working capital. However, similar cash flow benefits can also be obtained by borrowing. Leasing can therefore only claim to offer unique cash flow advantages if a firm faces capital rationing and lease finance is the only viable method of raising additional funds to finance capital expenditure.

It is also apparent from the various studies that incorrect approaches were being used to evaluate finance leases. Sykes, Hull and Hubbard and Ferrara *et al.* have expressed concern regarding the methods which companies used to evaluate finance leases. For example Sykes found that only 19% of UK companies used DCF methods to evaluate leases. Hull and Hubbard found that only 49 per cent of lessees used discounted cash flow techniques, and of those that did, 46 per cent used the wrong interest rate.

Taylor and Turley (1985) in the UK and Abdel-Khalik *et al.* (1981) in the USA have examined the effects of lease capitalisation on company financing. These studies indicated a move towards structuring leasing arrangements so as to avoid capitalising finance leases. Taylor and Turley also reported that a sizeable proportion of the respondents believed that leasing would be less attractive (41%) and that the volume of future leasing would be affected (34%).

The questionnaire survey

The surveys by Fawthrop and Terry (1975), Sykes (1976), Hull and Hubbard (1979) and Tomkins *et al.* (1979) were undertaken in the 1970s and the findings are not appropriate in today's vastly different taxation and financial reporting environment. A major weakness of these studies was that the replies were not analysed by firm characteristics, nor did they clarify the importance of various factors in the lease or purchase decision. A new study was therefore undertaken to obtain a better understanding of today's actual practice and the factors influencing the lease or purchase decision.

The research instrument used was a postal questionnaire to the finance directors of a sample of UK quoted companies. Questions requiring responses on a Likert scale were asked about various aspects of leasing. Prior to mailing the questionnaire a pilot survey was undertaken. This consisted of a group of 15 companies, which were selected on the basis of their extensive involvement in leasing. An accompanying letter asked for comments on the questionnaire and requested an interview or telephone conversation. A final version of the questionnaire was prepared based on the comments received from the pilot group and was circulated to 988 subject firms in February 1987 randomly sampled from a list of UK quoted companies (which number approximately 2,000). A response rate of 28% was obtained, 273 replies being received. The final version of the questionnaire contained 69 questions.

Financial information on the respondents was obtained from Datastream and the replies were analysed by size (based on sales turnover), profitability (based on return on capital employed), gearing ratios, interest cover ratios, liquidity (working capital ratio), growth in sales turnover and taxpaying status.[3]

The replies to the 69 questions were then analysed by frequency intervals for each of the seven financial characteristics, and frequency distributions were prepared. An examination of the replies by frequency intervals for each frequency distribution indicated that the most interesting comparisons related to the highest and lowest frequency intervals. The Mann-Whitney U Test was used to test for differences between these intervals for those questions which required ordinal scale answers and the chi-squared test was used for the remaining questions which required dichotomous or nominal scale answers.[4] A significance level of 5% was chosen as the critical level for reporting the differences.

Results of the questionnaire survey

The respondents were asked the following question:

> How important are the factors (listed in Table 2) in your company's decision to acquire assets by finance leases rather than purchase (or borrow and purchase)?

A summary of the replies is shown in Table 2. The cost of leasing compared with borrowing, corporation tax considerations and, to a lesser extent, conservation of working capital were considered to be the most important factors. Qualitative factors were not considered to be particularly important. Table 2 suggests that leasing decisions were based mainly on a comparison of the cost of alternative sources of finance.

Firms with different characteristics may attribute different levels of importance to the various factors in the lease or purchase decision. Table 3 shows details of those responses which differed significantly for firms with different financial characteristics. It is apparent from this table that larger and smaller firms attached significantly different levels of importance to all of the factors listed in Table 2.[5]

Significantly different levels of importance were also observed when the replies were analysed by taxpaying status and interest cover but no differences were observed for the remaining financial characteristics. The impression given by the analysis is that larger firms tended to make the lease or purchase decision after considering the taxation aspects and comparing the relative costs of the different sources of finance. Qualitative and cash flow factors were of little importance. The smaller firms attached far more importance to the qualitative and cash flow aspects of leasing, but the relative cost of the different sources of finance was still the dominant factor. It would appear that smaller firms lease for a variety of reasons, whereas larger firms concentrate mainly on the cost of leasing relative to other sources of finance.

We also asked a question relating to the importance of various factors which influenced the decision to use sources of finance other than leasing. Table 4 shows a summary of the replies to the following question:

> How important to your company are each of the factors (listed in Table 4) when the decision is made to finance the acquisition of an asset by a source of finance other than leasing?

The most important factors relate to the cost of leasing relative to other sources of finance and the loss of taxation benefits. The replies indicate that there was no outright opposition to leasing because of such factors as non-ownership of the asset or that some key executive was opposed to leasing.

---

[3] Growth was measured by comparing total sales between 1982 and 1985. Sales for each year were adjusted by the retail price index and expressed in 1985 pounds. Average growth was measured by relating 1985 sales to 1982, 1983 and 1984. Non-taxpaying status related to the year in which the agreement was signed and the following year.

[4] The Kolmogorov-Smirnov (K-S) two sample test was also used, but as the results from this test confirmed the Mann-Whitney U test results at a lower significance level, the results from the K-S test are not reported.

[5] Large firms were defined as those with a turnover in excess of £500m. We also analysed the differences in responses by re-defining larger firms as those with a turnover in excess of £100m ($N = 118$). There was still a significant difference (at the 5% level) between the replies of the small firms (for all of the questions listed in Table 2) and the replies from those with a turnover in excess of £100m.

Table 2
The importance of various factors in the lease or purchase decision

	Vitally Important %	*Above Average Importance* %	*Average Importance* %	*Below Average Importance* %	*Not Important* %
A. Rate of interest implicit in lease financing compared with borrowing.	50.6	30.3	11.7	3.9	3.5
B. Corporation tax considerations.	38.7	28.3	22.6	5.2	5.2
C. Leasing is easier to arrange, from an administrative point of view, than borrowing.	0.9	3.5	17.1	18.4	60.1
D. Lease finance can be obtained with greater ease and fewer restrictions than other forms of finance.	0.4	6.6	22.5	20.7	49.8
E. Conservation of working capital.	11.0	24.2	30.0	10.6	24.2
F. Ability of a lease to offer a complete package including, for example, service agreements (i.e. sales–aid leasing).	0.4	10.1	24.0	21.8	43.7
G. Leasing permits 100% financing—the full cost of the asset is met.	2.2	12.8	28.6	17.2	39.2
H. Leases can be arranged in which the rental payments increase over the lease period, thus enabling low rentals to be charged against profits in the early stages of a project's life.	0	8.4	13.9	27.9	49.8
J. Other (please specify).					

The replies were also analysed by financial characteristics using the same approach as that described in the previous section. Table 5 shows the details for those responses which differed significantly for firms with different financial characteristics.

Past and Future Leasing Activity

Details of past and estimated future leasing activity are shown in Table 6. Throughout the six years 1983–88 approximately 60% of the respondent companies were involved (or expected to be involved) in finance leasing. The majority of the lessees limited leasing to less than 25% of their new asset acquisitions. Overall, firms did not anticipate any significant changes in their leasing activities in 1987 and 1988 even though the tax changes became fully effective in April 1986 and many firms were starting to capitalise finance leases in order to meet the requirements of SSAP 21.

Table 7 shows an analysis of leasing activity for a particular year against taxpaying status for that and the following financial year. We attempted to classify firms according to the number of years they expected to remain non-taxpayers, but virtually all of the non-taxpaying firms included in the survey were non-taxpayers for not more than two years. It can be seen from Table 7 that prior to 1986 non-taxpaying firms were not only more likely to lease but were also more likely to lease a larger proportion (over 25%) of asset acquisitions. These differences were significant at the 5% level using a chi-square test. From 1986 onwards there was no significant difference between the volume of leasing for taxpaying and non-taxpaying firms. Indeed there was a significant decline in the volume of leasing by non-taxpaying firms after 1986. This presumably reflects the substantial reduction in the taxation benefits from leasing for non-taxpayers during this period.

Multivariate Analysis

We analysed the volume of leasing between 1983–88 by financial characteristics in order to determine whether or not particular characteristics influenced the volume of leasing. A stepwise multiple regression analysis was performed with the volume of leasing for each year representing the dependent variable and the seven financial characteristics representing the explanatory variables. These models are presented in Table 8. It can be seen that, for 1983, only 18% of the variation in the volume of leasing was explained by the variables included in the model. The R^2 value for the remaining years is lower than the observation for 1983. It was not possible to develop models for 1986–1988 using the stepwise analysis as none of the explanatory variables was significant at the 5% level.

The correlation matrix showing the correlation between the variables for 1983 is presented in Table 9. It can be seen that the highest level of correlation between the explanatory variables

Table 3
Importance of various factors in the lease or purchase decision analysed by financial characteristics

	Vitally Important %	*Above Average Importance* %	*Average Importance* %	*Below Average Importance* %	*Not Important* %	*N*
A. Rate of interest implicit in lease financing compared with borrowing:						
(1) £0–£10m sales	32	49	11	6	2	53
£500m + sales	77	10	7	3	3	39
(2) <2 interest cover	32	27	23	14	4	22
>2 interest cover	58	25	7	5	5	60
(3) Taxpaying firms	57	28	10	2	3	222
Non-taxpaying firms	37	23	24	13	3	41
B. Corporation tax considerations:						
£0–£10m sales	19	30	36	9	6	53
£500m + sales	62	15	15		8	39
C. Leasing is easier to arrange from an administrative point of view than borrowing:						
£0–£10m sales	2	9	36	17	36	53
£500m + sales		3	5	23	69	39
D. Lease finance can be obtained with greater ease and fewer restrictions than other forms of finance:						
(1) £0–£10m sales	2	13	40	11	34	53
£500m + sales		5	3	23	69	39
(2) <2 interest cover		32	41	9	18	22
>2 interest cover		3	19	27	51	59
(3) Taxpayer		4	16	24	56	222
Non-taxpayer		23	40	10	27	41
E. Conservation of working capital:						
(1) £0–£10m sales	23	32	30	7	8	53
£500m + sales	5	8	18	13	56	39
(2) <2 interest cover	37	27	18	9	9	22
>2 interest cover	5	26	39	8	22	58
F. Ability of a lease to offer a complete package:						
£0–£10m sales	2	19	30	26	23	53
£500m + sales		5	10	15	70	39
G. Leasing permits 100% financing:						
(1) £0–£10m sales	4	17	44	26	9	53
£500m + sales		5	15	8	72	39
(2) <2 interest cover	10	24	38	14	14	22
> 10 interest cover		5	31	22	42	58
H. Leases can be arranged in which the rental payments increase over the lease period:						
£0–£10m sales		15	19	40	26	53
£500m + sales			10	30	60	39

*All of the differences are significant at a 5% level using the Mann–Whitney U Test.

nd leasing activity is 0.32 which relates to taxpaying status. The correlation coefficients between axpaying status and leasing activity for 1984, 1985 nd 1986 were 0.284, 0.135 and 0.071 respectvely. It is clear from our analysis that (apart rom taxpaying status) leasing activity cannot be xplained in terms of the financial characteristics vhich were included in the model.

The Impact of the 1984 Finance Act and SSAP 21

The following questions were asked regarding changes in future leasing activity arising independently, first from the replacement of 100% first year allowances with 25% writing down allowances; and second from the introduction of SSAP 21.

Table 4
Factors influencing the decision to finance the acquisition of an asset by a source of finance other than leasing

	Not Important %	*Below Average Importance* %	*Average Importance* %	*Above Average Importance* %	*Vitally Important* %
A. Leasing more expensive than borrowing.	2.9	3.7	6.6	35.3	51.5
B. Loss of grants/taxation allowances if asset leased.	11.3	8.8	19.8	25.6	34.5
C. Some key executive(s) opposed to leasing.	51.3	23.3	16.1	6.3	3.0
D. Lack of awareness of leasing.	58.8	20.2	16.3	3.4	1.3
E. Company does not have legal ownership of the asset.	42.2	27.0	21.5	7.6	1.7
F. Leasing indicates a source of financial weakness.	52.4	24.5	18.4	3.4	1.3
G. Leasing is more difficult to arrange than borrowing.	51.6	22.6	17.2	7.2	1.4
H. Tax variation clauses in lease contracts make other sources of finance appear more attractive.	26.7	16.3	35.7	16.7	4.6
J. Leasing requires advance rentals and so does not provide 100% financing.	42.0	26.0	27.4	4.1	0.5
K. Other (please specify).					

Table 5
Factors influencing the decision to finance the acquisition of an asset by a source of finance other than leasing analysed by financial characteristics

	Vitally Important	*Above Average Importance*	*Average Importance*	*Below Average Importance*	*Not Important*	*N*
B. Loss of grants/taxation allowances if assets leased:						
(1) £0–£10m sales	14	11	29	28	18	57
£500m + sales	8	10	13	15	54	39
(2) <2 interest cover	19	29	10	14	28	22
>2 interest cover	9	5	24	33	29	66
J. Leasing requires advance rentals and so does not provide 100% financing:						
£0–£10m sales	25	25	44	6		57
£500m + sales	53	33	14			39

*All differences are significant at the 5% level using the Mann-Whitney test.

Table 6
Leasing as a percentage of new asset acquisitions

	Leased assets as a percentage of new assets				
Accounting year end falling in:	*Zero*	*1–25%*	*26%–50%*	*51%–75%*	*76%–100%*
1983	42.7	39.9	7.3	6.0	4.1
1984	39.5	41.4	8.2	6.8	4.1
1985	38.7	41.0	10.8	5.0	4.5
1986	44.2	40.0	8.8	3.3	3.7
1987*	41.3	42.7	8.3	5.5	2.2
1988*	40.2	43.8	8.2	5.0	2.8

*Indicates figures based on estimated rather than actual volume of leasing.

Table 7
Percentage of new assets leased analysed by taxpaying status

		Zero	*1–25%*	*Over 25%*	*N*
1984 Leasing:	1984/85 Taxpayer	44	44	12	220
	1984/85 Non-taxpayer	19	35	46	48
1985 Leasing:	1985/86 Taxpayer	40	44	16	222
	1985/86 Non-taxpayer	29	34	37	41
1986 Leasing:	1986/87 Taxpayer	41	42	17	227
	1986/87 Non-taxpayer	41	38	21	32

Table 8
Regression models for leasing as a percentage of assets acquired (1983–1985)

Regression models for leasing as a percentage of assets acquired (1983–1985)

	Constant	*Taxpaying Status**	*Interest Cover*	*Gearing Ratio*	*R^2*
1983 Leasing	9.87	18.25	0.047		0.18
Volume	(5.06)	(4.79)	(3.10)		
1984 Leasing	11.33	17.98	0.060		0.14
Volume	(5.48)	(4.64)	(2.49)		
1985 Leasing	11.05	8.61		0.283	0.05
Volume	(4.70)	(2.26)		(2.05)	

Notes
t values in parentheses.
*Taxpaying status: 0 = Taxpayer, 1 = Non-taxpayer.

Table 9
Correlation matrix: volume of leasing and financial characteristics (1983)

	Volume of Leasing (1983)	*Working Capital Ratio* (1983)	*Interest Cover Ratio* (1983)	*Gearing Ratio* (1983)	*Turnover* 1983	*ROCE* 1983	*Future Growth* 1983–86
Working capital ratio (1983)	−0.072	1.000					
Interest cover ratio (1983)	0.234	−0.132	1.000				
Gearing ratio (1983)	0.140	−0.194	0.057	1.000			
Turnover (1983)	0.001	−0.152	0.050	0.343	1.000		
ROCE (1983)	−0.157	−0.015	−0.122	−0.073	0.045	1.000	
Future growth	0.073	−0.148	−0.053	−0.102	−0.200	−0.002	1.000
Taxpaying status*	0.302	−0.049	0.078	0.074	0.051	−0.280	−0.112

*Taxpaying status: 0 = Taxpayer for 1983/84; 1 = Non-taxpayer for 1983/84.

(1) Compared with 1985, how will the extent of your company's finance leasing change in the future as a result of the first year capital allowance being replaced by annual writing down allowances?
(2) Compared with 1985, how will the extent of your company's finance leasing change in the future as a result of SSAP 21 requiring the capitalisation of finance leases?

The responses to these questions are set out in Table 10. When the responses were analysed by financial characteristics, statistically significant results were observed between the replies of the small

Table 10
Effect of changes in capital allowances and SSAP 21 on future leasing activity

		% of respondents indicating opinion				
		Significant Decrease	*Some Decrease*	*No Change*	*Some Increase*	*Significant Increase*
(A)	Effect of first year allowances being replaced by annual writing down allowances	11.4	14.0	62.0	10.9	1.7
(B)	Effect of SSAP 21	3.1	11.4	82.9	2.6	

Table 11
Effect of changes in capital allowances on financial leasing activity analysed by size

	% of respondents indicating opinion			
	Decrease	*No Change*	*Increase*	*N*
£0–£10m sales*	13	62	25	53
£100m–£500m sales	25	58	17	79
Over £500m sales*	56	39	5	39

*The responses from the small and large firms are significantly different using the Mann-Whitney U Test at a 5% significance level.

firms and large firms (turnover in excess of £500m). The analysis indicates that 56% of the larger firms intended to decrease their leasing activity as a direct result of the changes in capital allowances (see Table 11). There is little evidence to suggest that smaller firms will significantly reduce their leasing activities. Surprisingly, 25% of the smaller firms indicated that future leasing activity would increase. Unless there is some systematic reason which we were unable to determine to explain such an attitude, this response rate suggests an inadequate understanding of the issues involved when considering the lease or purchase decision.

A question was asked regarding the extent to which the respondents believed that other companies would seek to structure new lease contracts in a way which did not require capitalisation. A sizeable proportion of the respondents (44%) supported the view that firms would replace finance leases with operating leases. Similar findings were also reported by Taylor and Turley (1985) in an earlier UK study. There was a significant difference between the responses of the larger and smaller firms, with 38% of the large firms and 65% of the smaller firms supporting the view that companies would replace finance leases with operating leases in order to avoid the definition of finance lease adopted in the standard. These differences may have arisen because the respondents from the smaller companies are less 'financially sophisticated' than those answering on behalf of the larger companies. In the earlier drafts of the questionnaire we related this question to the respondents' *own* company. At the pilot survey survey stage the respondents indicated that their firms would not engage in such activities. However, when questioned about the activities of other companies they supported the view that other companies would replace operating leases with finance leases. The responses to this question do not therefore indicate what financial managers will actually do when confronted with the possibility of structuring a lease contract so as to avoid lease capitalisation. However, it would appear that many financial managers may think that the market can be misled by off-balance sheet financing. If this is true then one would expect that some companies will seek to replace finance leases with operating leases.

Evaluation of Finance Leases

Questions were asked on lease evaluation. The responses indicated that 88% of the firms estimated whether or not they would be paying corporate taxes over the life of the proposed leases when they evaluated finance leases. The majority of the companies (86%) considered the leasing decision to be a financing decision which should be taken only after the decision to acquire the asset had been made. Respondents were also asked with which alternative source of finance leasing is compared: 81% of the firms indicated that leasing is compared with borrowing (bank borrowing (50%), hire purchase (15%), all forms of borrowing rather than a specific type of debt (16%)). The remaining 19% of the firms compared leasing with internal finance.

The leasing decision has no effect on the required amount of equity. If a firm decides to alter its target debt ratio, leasing should be compared with borrowing as a means of altering the target ratio. In the case of an increase, the decision should be whether to increase the debt ratio by leasing or borrowing, whereas with a decrease the decision will be to use equity instead of debt or lease finance. It is therefore inappropriate to compare the cost of leasing with the cost of equity finance.

With regard to the evaluation methods used in practice, 57% of the firms compared the present value of the lease with the present value of the borrowing alternative. Approximately 10% of the firms used more than one evaluation method, with the majority using a combination of NPV and IRR. Other evaluation methods used were IRR (23%), equivalent loan method (15%) and no formal evaluation method (15%). The responses to the questions on lease evaluation suggest that there is little difference between theory and practice regarding approaches which are used to evaluate finance leases. However, we found evidence which suggested that some firms were using the wrong interest rate to evaluate leasing contracts. We asked the respondents to indicate the interest rates which they used to evaluate finance leases.

The analysis indicated that:

(1) 22% of the firms incorrectly used the before tax rate as the interest rate. (These firms were taxpaying firms and therefore the after tax borrowing rate is the appropriate interest rate.);
(2) 5% of the firms incorrectly used the after tax borrowing rate as the interest rate. (These firms were non-taxpayers.);
(3) 14% of the firms used the WACC as the interest rate;
(4) 14% of the firms used non-discounting methods.

A total of 41% of the companies were using the wrong interest rate and a further 14% used non-discounting methods. The fact that 22% of the companies were using the before tax borrowing rate is particularly disturbing as the vast majority of these companies were expected to be taxpayers throughout the entire period of the study. Indeed, for those companies who have been temporary non-taxpayers for a period of up to two years, the after tax borrowing rate will still be significantly different from the before tax rate. For example, a before tax borrowing rate of 14% is equivalent to an after tax rate of 9.1% (assuming no time lag in the payment of tax), 9.91% (assuming a 2 year lag) and 10.28% (assuming a 3 year time lag).

Thus it would appear that many companies were overstating the interest rate by several percentage points by using either the before tax borrowing rate or the weighted average cost of capital. Approximately 30% of these companies had a turnover which was in excess of £100m. The effect of overstating the interest rate is incorrectly to bias the evaluation in favour of leasing.

Lease valuation models are based on the assumption that lease finance displaces virtually an equivalent amount of debt. The survey sought to ascertain company views on this assumption. Respondents were asked the extent to which they agreed with the following statements:

(A) A commitment to lease an asset which cost £1m reduces the borrowing capacity of a company by exactly £1m;
(B) A commitment to lease an asset which costs £1m reduces the borrowing capacity of a company by less than £1m.

The responses indicated that 63% of the firms did not agree with Statement A and 62% agreed with Statement B. In other words the evidence is that the majority of firms consider that leasing reduces borrowing capacity by a smaller amount than an equivalent loan. The surveys by Sykes (1976) and Fawthrop and Terry (1975) also reported that leasing is likely to use less borrowing capacity than the equivalent amount of loan finance. However, these surveys were undertaken at a time when there was no requirement for leasing obligations to be shown in published financial statements.

Whether or not firms do use lease finance as a way of fully exploiting debt capacity to the limits is questionable. Management may set their own conservative limits on the use to be made of credit facilities. Furthermore leasing can only fully exploit debt capacity if financial institutions consider leasing and debt finance are not equivalent financial instruments. If leasing (when compared with borrowing) does increase a firm's debt capacity the important question is by how much. If the effect is only minimal the assumption that the proportion of a firm's borrowing capacity displaced by an equivalent amount of lease finance is sufficiently close to 1 may be justified. It is difficult to accept that (given that finance leases are capitalised) a lease with an equivalent loan of £1m displaces borrowing capacity by an amount which is *significantly* less than £1 million. Future research ought therefore to concentrate on the proportion of a firm's borrowing capacity displaced by an equivalent amount of lease finance rather than ascertaining whether or not leasing displaces an equivalent amount of debt.

Summary and conclusion

The evidence from our questionnaire survey suggests that taxation considerations and the relative cost of leasing compared with other sources of finance were the dominant factors which determined the lease or purchase decision within the larger firms. Qualitative and cash flow factors were of little importance. Our analysis indicated that between 60% and 70% of the larger firms would be signing finance leases during 1987 and 1988.[6] Approximately 90% of these firms were taxpayers. Given that these firms have indicated that cost was the dominant factor influencing the lease or purchase decision we assume that the larger companies were expecting to be able to negotiate leasing contracts which were not more costly than alternative sources of finance. For the larger companies we would expect both lessor and lessee to face the same borrowing and procurement costs. Thus the only potential cost advantage arising from a leasing agreement would be the tax savings arising from the lessor being able to capture the tax shields earlier than the lessee because of the year-end effect.

Where the lessor cannot capture any cost savings over and above those which could be obtained by the lessee from borrowing and purchasing the asset, it is difficult to explain why both parties would wish to enter into a leasing agreement. It does not seem to make sense for the lessor to be introduced as a third party into the process of raising finance when a firm can raise funds just as cheaply itself. The only justification for leasing in these circumstances would be where the qualitative factors outweigh the negative NAL arising from the leasing agreement. However, our findings indicate that for the larger companies qualitative factors tend not to be very important in the lease or purchase decision. A further explanation is that somehow firms were acting in an irrational manner. We have reported that approximately 30% of the larger firms appeared to be using the wrong interest rate and biasing the decision in favour of leasing. Larger companies might be attracted to leasing rather than purchasing for specific types of assets. Computers and cars fall into this category but these assets tend to be financed by operating rather than finance leases. A further reason for large companies leasing is that they may limit their leasing activities to specific assets which have low values and in which the lessor can save on the procurement and transaction costs.

The evidence from our questionnaire survey indicated that the smaller companies attached far more importance than the larger companies to the qualitative and cash flow factors, but cost was still the dominant factor. It would appear that smaller companies lease for a variety of reasons. Assuming that smaller companies do not acquire assets with substantial values, then the tax benefits arising from the year-end effect will be minimal. However, the lessor may be able to borrow at a cost which is significantly lower than the small company lessee and also make cost savings in the procurement of assets. These savings, together with the lower risk associated with leasing, may enable the lessor to offer a leasing contract which has an implicit interest cost which is lower than the interest on an alternative loan. Even if this is not possible and the leasing agreement has a zero or small negative NAL, it is clear from the survey findings that there are several other important factors besides cost which may explain why smaller firms do lease.

The survey findings suggested that many of the firms were using incorrect interest rates and were overstating NAL. An alternative view is that the leasing market is competitive, and market forces will drive the interest rate which is implicit in leasing agreements to a level which is equal to the lessor's lending rate. In this situation the lease valuation process would not normally play an important part in the decision process, and the lease or buy decision would be made on the basis of other qualitative factors. However, our discussions with the executives from the leasing company indicated that most leasing agreements arise from a negotiation process and the interest rates implicit in the lease are not uniform for all leases. In this situation those lessees which incorrectly value finance leases will be using wrong information within the negotiation process. There is a danger that they will fail to negotiate the best leasing deal and may mistakenly believe that they are negotiating leases with a positive NAL.

We believe that this survey has provided a useful insight into the factors influencing the lease or purchase decision. However, it is most unlikely that the replies from a postal questionnaire will provide an insight into the internal politics and managerial motivations which influence the lease or purchase decision. Future research should seek to understand in more depth the motivations influencing the decision to lease or borrow. There is a need for in depth interviews and case studies to ascertain why some assets were leased and others were not. This research should establish the types and values of assets leased and ascertain the perceived advantages of using lease finance. The case studies should also describe the lease negotiations and the methods of lease evaluation used within this process. In particular, the studies should describe a variety of leases ranging from small ticket to large ticket leasing, and they should focus not only on negotiations which have resulted in leasing contracts but also on those enquiries and negotiations which have not.

---

[6] We analysed the volume of leasing by 7 turnover categories. The volume of leasing was approximately 60% for each of these categories.

References

Abdel-Khalik, A. R. *et al* (1981), 'The Economic Effects on Lessees of FASB 13', *Research Report for the Financial Accounting Standards Board (USA).*

Anderson, P. R. and Bird, M. M. (1980), *Industrial Marketing Management*, September, pp. 111–118.

Anderson, P. F. and Martin, J. D. (1977), 'Lease v Purchase Decisions: A Survey of Current Practice', *Financial Management*, Spring, pp. 41–47.

Devereux, M. and Mayer, C. (1984), 'Corporation Tax: the 1984 Budget', *Institute for Fiscal Studies, Report No. 11.*

Fawthrop, R. A. and Terry, B. (1975), 'Debt Management and the Use of Leasing Finance in UK Corporate Financing Strategies', *Journal of Business Finance and Accounting*, Autumn, pp. 295–314.

Ferrara, W. L., Thies, J. B. and Dirsmith, M. W. (1980), 'The Lease–Purchase Decision', *National Association of Accountants.*

Higson, C. (1985), 'An Empirical Study of Corporate Tax Loss Positions', unpublished paper, London Business School.

Hull, J. C. and Hubbard, G. L. (1979), 'Lease Evaluation in the UK: Current Theory and Practice', *Cranfield School of Management.*

Myers, S. C., Dill, D. A. and Bautista, A. J. (1976), 'Valuation of Financial Lease Contracts', *Journal of Finance*, June, pp. 799–819.

Sykes, A. (1976), 'The Lease–Buy Decision—A Survey of Current Practice in 202 Companies', *Management Survey Report No. 29, British Institute of Management.*

Taylor, P. J. and Turley, S. (1985), 'The Views of Management on Accounting for Leases', *Accounting and Business Research*, Winter, pp. 59–66.

Tomkins, C. R., Low, J. F. and Morgan, E. J. (1979), *Leasing*, Saxon House, 1979.

Wilkins, T. and Zimmer, I. (1983), 'The Effect of Leasing and Different Methods of Accounting for Leases on Credit Evaluations', *Accounting Review*, October, pp. 749–764.

Journal of Business Finance & Accounting

Editor: Richard Briston

Spring 1990 **Contents** **Vol. 17 No. 1**

The Distributional Properties of Financial Ratios in UK Manufacturing Companies by MAHMOUD EZZAMEL AND CECILIO MAR-MOLINERO
Development of a Class of Stable Predictive Variables: The Case of Bankruptcy Prediction by HARLAN D. PLATT AND MARJORIE B. PLATT
The Relevance of Inflation Adjusted Accounting Data to the Prediction of Corporate Takeovers by JON W. BARTLEY AND CALVIN M. BOARDMAN
The Prediction of Takeover Targets in the UK by Means of Multiple Discriminant Analysis by PAUL BARNES
Grouping of Conglomerates by Their Segments' Economic Attributes: Towards a More Meaningful Ratio Analysis by RAPHAEL AMIT AND JOSHUA LIVNAT
On Analysts' Earnings Forecasts for Failing Firms by O. DOUGLAS MOSES
The Failure of UK Industrial Firms for the Period 1976–1984, Logistic Analysis and Entropy Measures by KEVIN KEASEY AND PAUL MCGUINNESS
Current Cost Accounting Ratios as Predictors of Business Failure: The Swedish Case by KENTH SKOGSVIK
Predicting Bankruptcy for Firms in Financial Distress by LISA R. GILBERT, KRISHNAGOPAL MENON AND KENNETH B. SCHWARTZ

Spring 1990 **Asian-Pacific Issue** **Vol. 17 No. 2**

The Use of Multiple Discriminant Analysis in the Assessment of the Going-Concern Status of an Audit Client by HIAN C. KOH AND LARRY N. KILLOUGH
A Study of International Financial Market Integration: An Examination of the US, Hong Kong and Singapore Markets by AREEPONG BHOOCHA-OOM AND STANLEY R. STANSELL
The Australian Securities Industry under Negotiated Brokerage Commissions: Evidence of the Effects of Change on the Structure of the Industry by MICHAEL AITKEN
An Alternative Measure of Mutual Fund Performance by JOHN OKUNEV
Daily Return Relationships Among Asian Stock Markets by INSUP LEE, R. RICHARDSON PETTIT AND MARK V. SWANKOSKI
The Determination of Audit Fees: An Analysis in the Singapore Context by LAY-CHIN LOW, PEARL HOCK-NEO TAN AND HIAN-CHYE KOH
American Put Pricing: Australian Evidence by G. F. LOUDON
Pricing of Foreign Currency Options for Arbitrary Stochastic Processes by KULDEEP SHASTRI AND KULPATRA WETHYAVIVORN

Subscriptions

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford, OX4 1JF, UK.
Editorial communications to *JBFA*, Department of Accountancy, University of Hull, Hull HU6 7RX, UK.

Accounting and Business Research, Vol. 20, No. 79, pp. 193–205, 1990

Towards Some Principles for Intangible Asset Accounting

Don A. Egginton*

Abstract—This paper examines the conceptual issues of intangible asset accounting in the context of recent controversies over the treatment of brand names and goodwill in company accounts. Issues of definition and recognition and the rationale for balance sheet disclosure are considered for goodwill and other intangibles. The implications of capitalising intangibles under accounting models based on present value, net realisable value, current cost and historical cost are examined, and certain principles are proposed. The problem of testing the validity of asset valuation is explored, and a test is developed on the basis of the 'recoverable amount' rule of historical cost. This test is demonstrated for two major UK companies.

Accounting for intangible assets is one of the most intractable problems of financial reporting. It is a problem which has conventionally been held at bay by ignoring internally developed intangibles, and by adopting arbitrary procedures for purchased intangibles. However, changes in the financial environment have caused intangibles to become increasingly important and controversial elements in corporate balance sheets.

The purpose of this paper is to examine the fundamental issues of accounting for intangible assets and to contribute towards the development of reporting principles in this area. Difficulties in reporting intangibles are founded on problems of definition and recognition, and the nature of those problems will be considered initially.

The rationale for capitalisation, as opposed to some other form of reporting on intangibles, and the validity of the usual distinction between purchased and internally developed intangibles also require examination. These aspects lead to the central considerations of whether (and if so how) intangibles should be capitalised under different accounting models. From capitalisation flow the associated problems of amortisation (under certain accounting models) and the credibility of the amounts assigned to intangibles in accounts. A credibility test for the recorded amounts of intangibles could enhance the quality of information to users, and it is with the development of such a test that the later part of this paper is concerned.

Problems of definition

A central problem of reporting intangibles concerns the circumstances under which they should be treated as assets. The definition of assets in general is therefore relevant. There is no formally accepted definition in the UK, but the ASC's ED 42 (1988, para, 14) has proposed a definition which is almost identical to that in the American SFAC 6 (1985): '... assets may be described at a general level as probable future economic benefits, controlled by and accruing to a particular enterprise as a result of past transactions or events'.[1] This establishes the three primary characteristics of an asset as probable future economic benefits, control, and a transaction or event which gives control. ED 42 does not offer a definition of 'probable' but SFAC 6 (note 18) says it 'refers to that which can be reasonably expected or believed on the basis of available evidence or logic, but is neither certain nor proved'. Thus a crucial hurdle is the judgment of what can be 'reasonably expected or believed' regarding 'probable economic benefits'; this is the question of recognition, to be considered later.

The distinction between intangibles and tangibles is more difficult. In the UK, the Companies Act 1985 (Sch. 4) requires separate disclosures for intangibles without defining them. The US APB Opinion 17 (1970) on accounting for intangibles similarly avoids a definition. But the Australian intangibles exposure draft, AARF ED 49 (1989, p.5) attempts what others have avoided. It proposes: '"intangible assets" means non-monetary assets without physical substance and includes but is not restricted to brand names, copyrights, franchises, intellectual property, licences, mastheads, patents and trademarks'.

---

*The author is Professor of Accounting at the University of Bristol, although much of the work on this paper was undertaken while he was visiting professor at the University of Newcastle, New South Wales. The paper has benefited from valuable comments from participants at a joint seminar of the University of Adelaide and the Flinders University of South Australia, and at seminars at the Australian National University, Bristol University, Newcastle University, NSW, and the University of New South Wales, Sydney. The author also wishes to thank David Tweedie and two referees for their constructive comments.

[1] The IASC (1988, para. 49) and Solomons (1988, p. 20) propose broadly consistent definitions, which are quoted with approval in ASC ED 47 (1990, Appendix, para. 9).

Unfortunately the AARF ED 49 definition is inadequate because non-monetary assets without physical substance would include items like prepayments and long-term investments, which are treated as tangibles in accounts. Hendriksen (1982, p. 399) rightly recognises that lack of physical substance does not give a clear-cut distinction between tangibles and intangibles. He suggests that the most important single characteristic of intangibles is the high degree of uncertainty regarding the value of future benefits. Although this is a tempting proposition, it cannot be a reliable means of distinguishing between tangibles and intangibles. For example, there could be more uncertainty over the future benefits of the tangible oil and gas reserves of a section of ocean than over the future benefits of the intangible European rights to the Coca Cola brand name.

The view adopted in this paper is that assets which are generally accepted as tangible *are assets which entail legal rights in relation to specific persons (real or corporate) as well as assets with a physical existence.*[2] Thus such items as debtors, prepayments and investments in securities, all involving legal rights relative to specific persons, are readily accepted as tangibles. *Intangible assets can therefore be defined as assets which either entail legal rights in relation to persons at large (such as patents or trade names), or entail expectations of economic benefits which carry no legal rights*—which is goodwill.

Intangibles other than goodwill are usually called either identifiable intangibles (for example, APB Opinion 17 (1970), AARF ED 49 (1989)) or separable intangibles (SSAP 22, 1984) although their nature is often left unclear. NZSA ED 43 (1988, para. 4.2) suggests that identifiable intangibles are those which 'can be sold or acquired separately'[3] (discussed in Tweedie and Blanchet, 1989). Since the operative word is 'separately', the term *separable* is more apt than identifiable and will be adopted here, even though UK usage has moved to identifiable in the Companies Act 1989 (Schedule 2, para. 9(2)) and ASC ED 47 (1990). Otherwise the NZSA definition is attractive, because it is consistent with the above definition of those intangibles which entail legal rights in relation to persons at large. It is difficult to envisage a valid sale of an item over which the vendor has no legal rights; conversely, anything over which an owner has legal rights can potentially be bought or sold.

Thus *separable intangibles* will be defined as *those intangible assets which entail legal rights in relation to persons at large.* The definition is still made in terms of legal rights, and does not require the existence of a market in the asset. It nevertheless remains consistent with 'can be sold or acquired separately', which is interpreted here as relating to the nature of the asset rather than to the nature of the market. Clearly, from the residue of the earlier definition of intangibles, goodwill is an *asset entailing expectations of economic benefits which carry no legal rights.* Under this definition, economic benefits of 'human assets', such as training, form part of goodwill unless protected in some way by legal rights.

Recognition issues

Definition as an asset does not ensure recognition in the balance sheet. But recognition in the prevailing historical cost context depends more upon what accountants are currently prepared to recognise than on unambiguous criteria. SFAC 5 provides some limited guidance in its four recognition criteria: an item should satisfy the required definition, be measurable, have relevance for users, and have reliability ('information is representationally faithful, verifiable and neutral'—para. 63). Solomons (1988, p. 43), in adopting corresponding criteria, states more plainly the central requirement that the item's 'magnitude as specified by the accounting model being used can be measured and verified with reasonable certainty'.

The term 'reasonable certainty' expresses the nature of the hurdle which must be surmounted for recognition in conventional accounts. Miller and Islam (1988, pp. 59–63) provide a good examination of the difficulties of interpreting such terms which relate to the probable economic benefits of an asset, but it is evident that reasonable certainty implies a high probability. Consider a situation in which a company's management and auditors are agreed that asset A has a 0.99 probability of producing £1m of economic benefits, whereas asset B has a 0.5 probability of £2m and a 0.5 probability of zero. A would normally be recognised as an asset (although not, for example, if A represented research costs of a new patent), but B's treatment would depend on its history and whether tangibles or intangibles were involved. For example, if B represented amounts from debtors currently recorded at £2m, it would be conventionally acceptable to recognise an asset of £1m (after reduction by a provision for doubtful debts). But B would be expensed if it represented advertising costs for a new brand.

---

[2] Chambers (1966) pp. 103–4 makes similar reference to legal rights in defining assets and adds 'extra-legal possession, by right of custom or tradition, is included; for insofar as the law respects custom and tradition, they are the law'.

[3] NZSA's ED 43 goes on to say: 'and the costs associated with acquisition of such an asset can be specifically identified as part of the cost of the asset'. This cost based definition is not pertinent to the consideration of treatment under alternative accounting models.

Consequently the biggest hurdle for recognition of intangibles may be an innate preference for tangible assets in accounting conventions, rather than questions of expected future benefits or whether magnitudes are sufficiently reliable for recognition. Some approaches to these issues will be considered later in this paper, but before proceeding it is necessary to consider major influences on the recognition of intangibles.

The economic context

A major reason for the growing importance of intangible assets has been an underlying trend in the nature of economic activity. Tangible assets alone have never been enough for business success, but changing technology and communication media require increasingly complex blends of resources for the operation of enterprises. Successful R&D, advertising, and the development of a wide range of human resource skills are vital in many industries. These expenditures often lead to long-term economic benefits and in some cases (such as agencies) intangibles far outweigh tangibles in their importance to the business. But the problem of applying recognition criteria to home-grown intangible assets has meant that they have not normally been capitalised when expenditure is incurred, the main exception in the UK being the capitalisation of development expenditure in limited circumstances.

However, when intangibles are acquired by purchase, particularly on take-over,[4] they are considered capable of recognition in conventional accounts. This is not logical. The magnitudes of costs of many internally developed intangibles, such as R&D and advertising, are no less identifiable than the costs of a takeover, and the future benefits from a takeover are unlikely to be more certain[5] than those from internally developed intangibles. Thus there is a serious problem of accounting comparability between companies which acquire intangibles externally and those which develop them internally.

Takeovers and the goodwill relationship

The recent level of takeover activity has given added significance to the treatment of intangibles. In the UK problems have been heightened by the range of treatments available in accounting for acquisitions and mergers, determined by the ASC's SSAP (1984) on goodwill, SSAP 23 (1985) on acquisitions and mergers, and the requirements of the Companies Acts. These problems have now been addressed by the Companies Act 1989 and by the ASC's proposals in ED 47 (1990) and ED 48 (1990).

SSAP 22 (para. 32) states that purchased goodwill 'should normally be eliminated from the accounts immediately on acquisition against reserves'. There were differences of opinion as to whether revaluation reserves were legally eligible for this purpose,[6] but the practice has been prohibited by the Companies Act 1989. There is a further option in SSAP 22 (para. 34) that goodwill 'may be eliminated from the accounts by amortisation through the profit and loss account'.

SSAP 23 allows either acquisition accounting or merger accounting. The Companies Act 1981 (consolidated into the Companies Act 1985) made merger accounting readily available by giving merger relief under certain conditions. An eligible company was relieved (by S 131 of the 1985 Act) of the normal requirement that premiums on the issue of shares should be transferred to a non-distributable share premium account. However, the Act did not require that merger accounting should be adopted in order to obtain the relief. Consequently takeovers treated as acquisitions under SSAP 23 have been able to benefit from merger relief in order to eliminate goodwill. This curious state of affairs was left unchanged by the Companies Act 1989.

Thus *laissez faire* has prevailed, with three major choices in accounting for takeovers, the first two of which involve recording purchased separable assets at 'fair value':

1. Goodwill eliminated immediately against reserves.
2. Goodwill capitalised initially, and amortised against subsequent profits.
3. Merger accounting, with assets recorded at historical cost and no recognition of goodwill or 'fair value' of purchased assets.

Within category 1 goodwill may be eliminated in any of the following ways:

(a) Against accumulated revenue reserves.
(b) Against capital reserves arising on consolidation.
(c) Against a merger reserve created on the issue of shares for an acquisition.

---

[4] Recognition practice varies for separate purchases of externally developed intangibles. For example, it would be normal to capitalise a bought-in patent which gives legal rights to a product, but transfer fees paid for legal rights to the services of football players are normally expensed. A break with the latter practice appeared in the 1989 accounts of Tottenham Hotspur plc, when the club capitalised transfer fees for the first time.

[5] For evidence on the very mixed fortunes of mergers see Meeks (1977).

[6] For example, Ernst and Whinney (1989, para, 4.6) states: 'It has been Ernst and Whinney's view, since the Companies Act 1981 was enacted, that, although the legislation was not perhaps as clear as it could have been, it was always intended that goodwill could not be written off against a revaluation reserve.'

(d) By cancellation of share premium account with approval of the court and use of the resulting reserve to write off goodwill.
(e) By the creation of a negative goodwill write off reserve.

ASC ED 47 (1990) would abolish category 1, and therefore the associated choices for elimination, aligning UK practice with IASC E 32 (1989). ASC ED 48 (1990) would restrict category 3 to business combinations which satisfy certain tests, the most important of which would be a test of the relative size of the combining entities; combinations which passed the tests would be required to adopt merger accounting. Consequently these two UK exposure drafts seek to eliminate accounting choice on capitalising goodwill.

Although SSAP 22 (para. 30) states that goodwill should not include any value for separable intangibles, which are to be shown separately, the dividing line has been both subjective and changing. Recent ASC guidance in TR780 (1990, para. 3.9) would restrict the recognition of intangibles, so that some previously recognised intangibles would boost goodwill. The problem of a dividing line was acknowledged in Australia in AGR 5 (1985), and in the UK a number of companies have recently capitalised intangibles which had been previously left as unidentified elements of goodwill.[7] However, the problem of the valuation line between goodwill and other assets is by no means confined to intangibles.[8] Thus the treatments of goodwill and other assets on takeover are closely related in practice.

Pressures for and against recognition

In January 1989 the ASC (1989) issued a provisional statement on intangibles with special reference to brands. This statement was made in response to announcements by UK companies that they were capitalising trade names, both purchased and internally developed, although without providing amortisation.[9] Essentially a holding operation pending the development of an exposure draft, the statement endorsed the recognition of purchased brands, discouraged revaluations and pointed out that there was a rebuttable assumption that intangibles have a limited 'useful economic life'.

A year later ASC TR780 (1990) set out proposals on intangibles intended for a forthcoming exposure draft. Taking a restrictive view of the intangible recognition, TR780 would permit the capitalisation of neither internally generated nor purchased brands, considering the latter to be part of goodwill. Instead it suggests (para. 3.27): 'reporting enterprises are encouraged to provide relevant information about brands in their financial statements that will help users to evaluate them'. This raises the question of why some companies have been changing their policies towards capitalising certain intangibles, rather than providing more detailed information.

One possibility is that company managements believe that capitalisation provides the most cost effective means of communicating information to users, along the lines of the arguments in Beaver and Demski (1979) regarding income measurement. This may be implied by company claims to 'provide a more realistic picture of shareholder funds'[10] or 'reflect economic reality'.[11] It is consistent with reasons that have been advanced for capitalisation of intangibles:

1. The scope for future acquisitions is enhanced, as elimination of intangibles on acquisitions would otherwise deplete balance sheet equity to an unacceptably low level.[12]
2. A reduced gearing ratio may assist future borrowing.[13]
3. Intangible asset valuations may provide defensive information disclosure in the face of a threatened takeover.[14]

---

[7] In their 1988 accounts several UK companies included amounts for purchased trade names which had previously been unrecorded in their balance sheets. Grand Metropolitan plc recorded £588 m brands as fixed intangibles; these brands had been purchased after 1 January 1985. Lonrho plc recorded £117 m for newspaper titles, for which no cost had been allocated at the date of acquisition of the subsidiaries concerned. Similarly Guiness plc recognised for the first time £1,695 m of brands purchased in the previous three years.

[8] For example, the *Australian Financial Review* of 12 November 1984 refers to the treatment by Elders IXL Ltd of its takeover of Carlton and United Breweries Ltd. The report states: 'Elders has ... sounded the death knell for the accounting standard on goodwill, by bringing in the [tangible] assets of CUB at almost the same value as the consideration paid for the company.... The bulk of the [tangible] assets acquired with CUB are ... brewing equipment which is stainless steel and lasts for years.... So in simple accounting terms the group has avoided a $250 m write-off.'

[9] The intention of the WPP group to value names of its subsidiaries was reported in *Accountancy Age* of 1 December 1988. Announcements by Rank Hovis McDougall plc and Grand Metropolitan plc are discussed in *Accountancy*, January 1989. The former company provides a rare example of capitalisation of internally developed trade names (in this case brands). However, an earlier example of capitalising an internally developed trade name is provided by Newspaper Publishing plc, which capitalised the value of *The Independent* newspaper title in its acccounts for the year ended 30 September 1987.

[10] Rank Hovis McDougall plc (1989) p.1.

[11] Guinness plc, quoted in *Financial Times*, 24 February 1989.

[12] Suggested as a motive for the capitalisation of goodwill by British and Commonwealth Holdings (*Financial Times*, 29 April 1988) and for capitalisation of brands by Hanson Trust (*Financial Times*, 1 December 1988).

[13] Suggested in Rank Hovis McDougall plc (1989), p. 2 and *Financial Times*, 12 December 1988 in relation to the TI Group.

[14] Raised in connection with the capitalisation of film and programme libraries in *Accountancy Age*, 16 February 1989, and also implicitly relevant to a report on Lonrho plc in the *Financial Times*, 27 January 1989.

However, there are also potential advantages to management which are consistent with the positive view of accounting theory advanced by Watts and Zimmerman (1978 and 1986). These are as follows:

1. Management faces less onerous borrowing constraints, which are expressed in company articles of association as some multiple of shareholders' funds. This has been suggeted as the motive for several cases of UK capitalisation.[15]
2. Management faces less onerous conditions for shareholder approval on acquisition or disposal of businesses, which is required by the Stock Exchange listing agreement when the assets involved exceed 25% of the company's own assets. Inclusion of capitalised trade names in the company's asset base raises the threshold for approval.[16]

The above apply irrespective of the accounting rules for goodwill. However, if accounting standards require goodwill to be amortised but do not specify the amortisation of trade names (as has been the case in Australia) there are further possibilities.[17] These give potential managerial advantages from choosing accounting treatments which minimise amortisation charges, such as the adoption of infinite lives for trade names, in the following circumstances:

1. Where constraints in borrowing trust deeds relate to earnings cover.
2. Where management compensation is linked to disclosed earnings.

These influences are unlikely to apply currently in the UK, where companies have effectively had the choice of writing off purchased intangibles direct to reserves by judicious use of the rules considered earlier.

There are also pressures against capitalisation. In particular, if accounting standards require capitalisation to be accompanied by amortisation, reductions in reported profits have adverse implications for managements. Procedures which write the cost of acquired intangibles against reserves are much more attractive to reserve-rich companies, leaving increased profits free of amortisation.[18]

The arguments against capitalisation of trade names which have recently commanded most attention in the UK are those in the London Business School (LBS) report on accounting for brands (Barwise *et al.*, 1989). At the risk of oversimplification, the report's arguments against capitalisation can be summarised in three major themes. The first is that the difficulty of meeting a criterion of reasonable certainty for asset recognition is too great, involving problems of asset separability, valuation and judgements on future profitability. The second is that market analysts did not consider that simple balance sheet capitalisation of brand names provided new information. Third, if companies want to give more information on intangibles there is nothing to stop them doing so outside the audited accounts, and the market can impound this information in share prices.

The first LBS theme encapsulates the problems which have led standard-setting bodies to avoid the issue in the past, but capitalisation in company reports audited by reputable firms shows that the hurdles are not insurmountable. On the question of user demand, the only hard evidence is provided by a survey of the Securities Institute of Australia (1989), which showed overwhelming support for recognising 'identifiable intangibles' in accounts.[19] As for management's unaudited views on intangibles, they would not have the credibility of audited accounts; if this were a realistic solution it would be equally applicable to other elements in the accounts, rendering both accounts and audits redundant.

The complexities of the issues make principles for intangible asset accounting all the more important to pursue. Whatever the bases that may be adopted, a principled approach needs to strive for consistency of treatment between internally developed and externally purchased intangibles. These considerations provide the context for the examination of measurement options.

Capitalisation under alternative accounting models

It is evident that the magnitudes attached to intangibles will differ according to the accounting model adopted. But a model's rationale can also affect the extent to which intangibles are capitalised, so that the issues to be explored concern the eligibility of intangibles to be recognised as assets for different accounting models. Those issues are strictly interrelated with the problem of amortisation: in some models recognition as an asset should be accompanied by an estimate of asset life, and the validity of that estimate should be tested in following periods. However, it will be convenient to start by examining principles of capitalisation.

---

[15] Hanson plc *Financial Times*, 1 December 1988, TI plc *Financial Times*, 12 December 1988, Cadbury Schweppes plc and General Cinema plc *Financial Times*, 4 May 1989.

[16] *Financial Times*, 1 December 1988 and 27 January 1989.

[17] It has been suggested in a seminar on this paper that the size hypothesis of Watts and Zimmerman (1986) could also explain capitalisation of trade names. The suggested grounds were that trade name capitalisation would give large companies greater scope for future changes in accounting treatments. However, Watts and Zimmerman's hypothesis (p. 235) states '*ceteris paribus*, the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods'. Thus the size hypothesis would suggest that managers would be eager to amortise assets rather than capitalise them.

[18] For example, among the critics of Australian proposals (AARF ED 49) for the capitalisation and amortisation of intangibles was Pacific Dunlop, a non-capitaliser. An Ernst and Young partner commented (*Business Review Weekly*, 1 September 1989): 'Companies like Pacific Dunlop are not particularly concerned at what their balance sheets look like; they are driven by their reported profit and loss... They just want to have their reported profit as high as possible.'

[19] To the question 'Should internally generated identifiable intangibles (e.g. brand names etc) be recognised in accounts?' the survey responses were 136 in favour with 48 against in New South Wales, and 30 in favour with 16 against in Victoria.

There are important variations within broad accounting models, but those variations are only relevant here to the extent that they have a bearing on intangible capitalisation. The four main models deserving consideration are, in ascending order of their adoption for corporate reporting, present value (PV), commonly called economic value,[20] net realisable value (NRV), current cost (CC), and historical cost (HC). It will be convenient to consider the models in that order. But as the last is the overwhelming reality of reporting practice, and was the setting for most of the earlier discussion, it requires the most consideration. Current purchasing power accounting will not be examined, as it can be regarded as an indexed version of HC accounts.

Present Value

In a PV model all elements contributing to the value of the enterprise would be encompassed in a balance sheet. Assets would be incorporated at amounts equal to the PVs of their expected contribution to future cash flows. It is debatable how effectively PVs can be assigned to individual assets in view of the jointness of many economic activities,[21] but it is evident that both goodwill and 'separable' intangibles would be represented in enterprise value irrespective of whether they were purchased or internally developed.

The PV model would offer an overall value for the enterprise. The subjectivity and potential volatility of this overall assessment are among the reasons the PV model is not adopted in practice. A pure PV model would also offer the possibility of an unending series of revised expectations which are incapable of confirmation. There is nothing to prevent future expectations being revised upwards to compensate for current shortcomings, which means that PV has severe limitations as a free-standing valuation for reporting purposes.

However, PV is of practical importance because it has a crucial role in other accounting models. In CC accounts it features explicitly in the 'value to the firm' rule. Where CC exceeds the PV of an asset held for use (i.e. a fixed asset), the asset is reduced to PV in the accounts.[22] In HC accounts PV masquerades under the term 'recoverable amount'. In the more forthright definitions, recoverable amount is simply the present value of discounted future cash flows.[23] In SSAP 12 (ASC, 1987) it is effectively the greater of NRV or PV. For HC accounts the application is a precise parallel of the CC 'value to the firm' rule: where HC exceeds recoverable amount of a fixed asset, the asset is reduced to its recoverable amount in the accounts. It will be seen later that this connection can be put to use in the context of intangibles.

PV is also relevant to the processes of valuation which are currently being adopted for trade name capitalisation in the UK and elsewhere. Most of these valuation methods estimate the present value of expected future benefits, with varying degrees of sophistication.[24] Although it might seem that a PV basis conflicts with prevailing HC conventions, the role of recoverable amount in HC and ambiguities in the UK Companies Act (to be discussed later) mean that PV can feature in accounts so long as it is not called PV.

Net Realisable Value

Methods for the development of accounting reports using NRVs (also termed exit prices, current cash equivalents, resale prices) have been extensively considered in the literature.[25] Since a major purpose of the NRV approach is to provide users with information on the value of assets in alternative uses, the separate marketability of an asset effectively both defines an asset and is the criterion for recognition. Thus goodwill, which is inseparable from the business, has no part to play.

One of the few extensive examinations of goodwill in this context is provided by Chambers (1966, pp. 209–212). In rejecting goodwill he contrasts it with tangible assets, and appears implicitly to exclude all intangibles from the balance sheet. If there is no market for separable intangibles that analysis is valid. But on the other hand, if there were an active market giving verifiable NRVs for separable intangibles, both purchased and developed separable intangibles must surely qualify as assets. Reality is somewhere in between: separable intangibles are commonly saleable, but only after negotiation and at prices which depend on unique characteristics, making comparison between intangibles of different companies a complex matter.

---

[20] See, for example, Scapens (1978).

[21] There are, of course, corresponding difficulties with allocating costs to assets over their lives, an issue explored particularly in the work of Thomas (1969, 1974). However, see Peasnell (1984), pp. 177–178) for an analysis which argues that the assignment of a PV representing the difference between two alternative values of the firm (with and without the asset) avoids allocation.

[22] For example, see Parker, Harcourt and Whittington (1986, p. 30).

[23] AARF ED 49, p.16 for a clear definition of recoverable amount.

[24] *European Accounting Focus* of March 1989 considers a number of alterantive methods of valuing brands. Those which might be considered to simulate exit prices are: 'The Interbrand Method . . . basically as simple as multiplying a profit figure by a PE ratio'; 'Branded good price premium . . . the brand's premium profits . . . [are] capitalised using a PE ratio as in the previous method'; 'Discounted cash flows'; 'Capitalised royalty income'.

[25] Particularly Chambers (1966), Sterling (1970) and (Lee 1984).

Thus separable intangibles cannot be regarded as fungibles, in the legal sense of items for which exact substitutes are obtainable. This need not necessarily be a barrier to the estimation of NRV; land and buildings lack fungibility but are the subject of professional valuations. However, it does mean that if separable intangibles were to be recorded in NRV accounts, they would need to appear at judgmental values intended to simulate NRV—which comes back to the PV-type valuations mentioned above.

Two things are clear. If NRVs are to be adopted, they should be used as part of a coherent model, not selectively for some assets chosen by management. And, since NRVs for separable intangibles must involve a departure from observable market prices, there would be a need for a testing procedure for the values adopted.

Less clear is how goodwill should be eliminated from NRV accounts. Since NRV accounts do not recognise the validity of such an asset, it would seem appropriate that equity should be correspondingly reduced, rather than expensing through the profit and loss account.

Current Cost

There is more than one approach to entry price accounting,[26] but CC will be adopted as a generic term for present purposes. CC's fundamental rationale, like that of NRV, is with providing measures based on the market price of assets. The changed focus, to prices at which resources can be replaced in the market,[27] may suggest that entry prices should be related to separable assets. However, the position is more complex than that, because two entry prices are available, originally defined by Edwards and Bell (1961) as follows:

> Present cost—the cost currently of acquiring the asset being valued.
>
> Current cost—the cost currently of acquiring the inputs which the firm used to produce the asset being valued.

Present cost is the obvious choice for purchased assets; it excludes purchased goodwill from the balance sheet because it has no separable identity for which a current entry price can be obtained. For internally developed assets, such as finished goods or work-in-progress, CC accounts normally adopt current cost as defined above. But for internally developed goodwill the lack of a separable identity is a barrier to capitalisation.

There is a more important reason from the user viewpoint for excluding goodwill from CC accounts. It is that the assessment of returns on assets against market costs of resources requires that the value of anticipated excess returns are not already incorporated in the asset base. Thus goodwill again has no part to play.[28] The elimination of purchased goodwill therefore poses the same problem as with NRV, and again an offset against equity would be appropriate. This is in fact the approach which was taken in the UK in implementing SSAP 16 (1980), although the reason seems to have been convenience rather than conviction.

It should be feasible to identify inputs for separable intangibles under CC accounting. The approach to the recognition of separable intangibles for CC would be the same as that for the HC model, an issue to be discussed below. If inputs have been recognised, their restatement at CC does not cause difficulties of principle, although implementation would be subject to the usual approximations of CC accounting.

Historical Cost

An immediate difficulty with HC is that there are two distinct models in use. Both adopt the basic principle that 'assets are recorded at the time of their acquisition at the amount of cash or cash equivalents paid or the fair value of the consideration given to acquire them' (IASC, 1988).[29] Both adopt the practice of prudence or conservatism, whereby the recorded amount is reduced if HC is greater than some measure of current worth to the owner (recoverable amount in the case of fixed assets). But the relatively pure forms of HC adopted in such countries as Germany, Japan, Switzerland and the USA discourage the upward revaluation of assets. By contrast, modified HC as practised in Australasia, the Netherlands, the UK and elsewhere permits the selective upward valuation of assets at the discretion of management (although a pending UK exposure draft on fixed assets may reduce this discretion).

There are obvious difficulties in attempting to develop principles for intangibles in a reporting system in which the valuation basis can be selec-

---

[26] Notably Edwards and Bell (1961), Gynther (1966), Revsine (1973), and the ASC's SSAP 16 (1980). These and other approaches are analysed in Whittington (1983) and Tweedie and Whittington (1984).

[27] This concern is modified under a system which adopts value to the firm, but entry price remains the prime concern.

[28] For a different view see Edwards, Kay and Mayer (1987), particularly pp. 45 and 62.

[29] SFAC 5 (1984) validly refers to the possibility of assets being acquired without an exchange transaction, for example, assets found or received as contributions. Implicitly, the IASC (1988) would adopt 'fair value' for such rare items.

CENTRAL

tively changed at the whim of management. If, as is the case with modified HC, it is possible to revalue selected tangible assets, there is no logical reason for restricting the process for intangibles. While the UK Companies Act 1985 (Schedule 4, para. 31) allows tangible fixed assets to be shown at 'market value' or current cost, intangibles (but not goodwill) may be shown at current cost.[30] However, as the Act defines neither market value nor current cost, the inconsistency is less restrictive than it seems.

The inherent conflicts of a modified HC system can really only be resolved in one of two ways: by reverting to 'pure' HC, or by adoption of an accounting model which contains coherent revaluation rules. Thus modified HC is strictly incompatible with the present exploration of principles, but it is the prevailing system. In the face of this dilemma the principled HC model will be considered to be the 'pure' form, but the conclusions will nevertheless have relevance to modified HC.

1. *Purchased intangibles and HC accounts*

The HC model requires that asset recognition depends on probable economic benefits and a magnitude that can be measured and verified with reasonable certainty. However, the distinctive feature of HC is that an external transaction establishes the amount at which an item is recorded, even if doubts about future economic benefits require the item to be swiftly expensed. Thus a principled approach to asset capitalisation requires that purchased intangibles, whether goodwill or separable intangibles, must be recorded as assets in the HC model unless economic benefits are so uncertain that recognition is withheld.

The proposed principle runs counter to ASC TR780 (1990), which rejects the separate capitalisation of purchased brands. It is, however, consistent with ED47 (1990) on purchased goodwill, which seems to have been influenced by proposals for standard international practice in IASC E32 (1989, para. 168).

An argument advanced for not treating purchased goodwill as an asset in the HC model is that the associated economic benefits are uncertain. A classic exposition of this view by Catlett and Olson (1968)[31] led to the recommendation that goodwill should be eliminated against equity at the time of purchase. Solomons (1988, pp. 68–69) doubts whether goodwill can satisfy a 'reasonable certainty' test. Attractive as the uncertainty argument is, it does not provide a rationale in the HC context for elimination of goodwill against equity. On the contrary, when benefits are too uncertain to justify capitalisation of costs, prudence in the HC model requires expensing to the profit and loss account.

Uncertainty can also be approached in another way, by revising estimates as new information emerges. Although a review is supposed to apply to fixed tangible assets (ASC, 1987) it has not in the past applied to goodwill. An annual review of goodwill proposed in ED47 (para. 19) would rely rather trustingly on the directors' assessment. There is a need for a review framework to be developed for all assets, and the test developed in the latter part of this paper offers one way in which a review might take place.

The method *par excellence* for evading the recognition of goodwill is the merger (or pooling) method of consolidation, which has spread from the US to some other countries in recent years. This method's retention of the pre-merger amounts for assets can only be defended under the HC model if no transaction has taken place. Yet clearly there has been a transaction.[32] If the parties really have equal status in that transaction, logic suggests that the transaction should be recognised from the viewpoint of both participants. The consequence would be that goodwill and the fair value of the separable assets of both companies would be recorded in the accounts.

Such treatment would turn merger accounting upside down. Instead of avoiding amortisation, merger accounting would lead (in the pure HC model) to amortisation of the goodwill of both participants in the merger. It can therefore be safely predicted that corporate managers would be unconvinced by the logic of such a procedure; it is anxiety over the effects on profits and reserves of goodwill write-offs which drives the popularity of the merger/pooling method. In part this anxiety stems from a legitimate concern that it seems unreasonable to reduce profits or reserves for something which has just been acquired and has not yet diminished in value,[33] but there are obvious managerial attractions in a method which shows acquisition at the HC of the seller rather than at the cost to the acquirer.[34]

---

[30] It may be unreasonable to expect logic from these rules, stemming as they do from the European Community Fourth Directive. The Directive was inevitably driven by compromises between national accounting conventions. It is arguable that current cost appears only by courtesy of the accountancy profession's short-lived enthusiasm (mainly in the UK) which coincided with negotiations on the Fourth Directive.

[31] Catlett reiterated that view in his dissent from APB Opinion 17 (1970).

[32] In contrast to this view, one of the referees of this paper points out that a merger might be deemed to have no transaction, with no acquirer and no acquiree.

[33] For example, the Group Finance Director of Grand Metropolitan plc wrote in an open letter to the Chairman of the Accounting Standards Committee on 21 January 1988:

'It is hard to understand why it is apparently acceptable that the investment in the subsidiary in the parent company balance sheet should be left at original cost (unless there has been a diminution in value), but in the group balance sheet the whole cost of the business which is not represented by 'separable net assets' should be written off.'

2. *Internally developed intangibles and HC accounts* For internally developed assets the costs of both separable intangibles and goodwill are potentially capable of capitalisation under the HC model, since they can arise initially from a verifiable cost outlay. The obstacles are the identification of probable economic benefits with specific outlays, and the difficulties of identifying and verifying an asset's magnitude with 'reasonable certainty'. There may be situations in which a causal relationship between outlays and future benefits could be established with sufficient strength for recognition in accounts without giving rise to a separable intangible; the most obvious candidate is human asset expenditure on training, etc. Thus there could be scope for devising methods of capitalising some elements of internally generated goodwill, although this is currently beyond the bounds of orthodoxy.

In cases where there is evidence of a causal relationship between outlays and future benefits, and the outlays can be identified with a separable intangible, it should be possible to satisfy the criterion of 'reasonable certainty' even for internally developed assets.[35] The main candidates are R&D costs (identifiable with patents and products) and advertising/promotion costs (identifiable with trade names). Evidence in relation to such costs indicates that causal relationships with future benefits do exist, but that the relationships are subject to considerable variations and benefits are not particularly long-lived.[36] A study by Hirschey and Weygandt (1985) suggests 1 to 5 year lives for advertising and 5 to 10 years for R&D.

The problems of recognising internally developed intangibles could be alleviated if accountants would modify their all-or-nothing recognition hurdle of reasonable certainty, by allowing capitalisation related to the probability of recovery (with a suitable health warning). It was pointed out earlier that such an approach is well-established in making provisions against debts, and recognition using probability may be a feature of a forthcoming UK exposure draft on 'fair value' accounting.

A further important possibility is that developed intangibles might be given some form of provisional capitalisation. This would signal that uncertainties over the establishment of a separable intangible had yet to be fully resolved, and would provide more information than the all-or-nothing approach. R&D and trade name development costs would be appropriate for this category, which could either appear as a separate item in the balance sheet or could be provisionally expensed and disclosed by way of note as a 'contingent asset'. The relevant costs could be placed to a suspense account for periods of one or two years, until either there was enough evidence for recognition of an asset or the costs were permanently written off.

As with purchased intangibles, the problem of uncertainty can be approached by revising estimates as new information emerges. Again this comes back to the need for some form of test procedure. Value estimates of developed intangibles have a part to play in testing, but it should be noted that capitalisation of such values without reference to HC is not consistent with the HC model being considered here.

Amortisation and the testing of asset amounts

An accounting system which adopted solely observable asset prices, whether entry or exit, would have no need for consideration of amortisation, the lives of assets, or tests of value; market prices would determine all. However, it has been seen above that even an NRV system would need to use simulated values if separable intangibles were to be incorporated in accounts. In all accounting models some broad test of the reasonableness of recorded amounts is desirable.

For intangibles in HC and CC accounts, assumptions about asset lives and amortisation impinge as well. The estimation of lives for most intangibles is, to put it mildly, difficult,[37] but there are some guidelines which can be established. At one extreme an infinite life for any economic benefit is implausible in the face of decay and a changing economic environment. Those who argue for infinite lives do so in the context of the present conventions in which fresh expenditures on intangibles (i.e. internally developed elements) are expensed rather than capitalised. The 'infinite life' argument is really a plea against the undoubted inequity of double-charging: the amortisation of purchased intangibles and the expensing of internally developed elements. The argument can only be defused in the context of changes in the recognition of internally developed intangibles, such as were suggested above.

---

[34] For a not entirely tongue-in-cheek discussion of this issue see Griffiths (1986), Ch 8.

[35] There is support for this view in AARF ED 49 (paras. 20–21), in Campbell (1989, p. 39) and in Leo (1989).

[36] A classic study of the economic effects of advertising, which estimated that economic benefits of advertising can last as long as 7 years, is contained in Palda (1965). However, both Abdel-khalik (1975) and Falk and Miller (1977) conclude that the benefits of advertising vary widely between firms, and Picconi (1977) found no significant correlation between advertising expenditures and future benefits.

[37] Patents are an exception so far as their legal lives are concerned, although economic life may be shorter than legal life.

At the other extreme is the evidence, provided by Hirschey and Weygandt (1985) and Palda (1965), which suggests that internally developed intangibles such as advertising expenditures (relevant for trade names) and R&D have lives which merit recognition as assets. But it is important to recognise that these lives are relatively short. It would be reasonable to expect such assets to be amortised over periods in the order of three to ten years.

Accounting standards do not stipulate maximum lives for tangible assets, but there is a growing fashion for setting or recommending maximum lives for intangibles, particularly goodwill. In the USA the period for goodwill is 40 years in APB Opinion 17; in Australia 20 years in AAS 18, and internationally there is a proposed range of 5 to 20 years in IASC ES 32. ASC ED 47 proposes 20 years for goodwill (with potential extension to 40), while AARF ED 49 proposes 20 years for identifiable intangibles (in line with AAS 18). There has been a curious absence of justification for these numbers, which are essentially a crude antidote against 'infinite lives' in the prevailing system in which internal spending on intangibles goes largely unrecognised. In the context of a reformed system which recognised internal spending on intangibles, the limits would look high on the evidence mentioned above.

When intangibles are amortised the method adopted is almost invariably straight line. That practice is questionable. The greatest benefits (and therefore the greatest erosion) of intangibles are likely to occur early in their lives, suggesting that some form of reducing charge would be more appropriate. By contrast Rutteman (1990) refers to a company whose goodwill 'amortisation rises year by year so that the initial amount is small and the effect on earnings per share will never be significant if inflation erodes the effect of subsequent increases'. Such a practice makes a nonsense of amortisation, since there is no attempt to match charges against benefits. ASC ED47 (para. 12) would require straight line or some basis that is "more conservative", but gives no benefit profile rationale.

Although guidance on amortisation can be helpful, it is unlikely that rigid rules can solve the problem. The rules would have to be very detailed to prevent the exploitation of loopholes, and consequently would run the danger of being inappropriate to some circumstances. There would be no need for such rigidity if a broad credibility test could be applied to balance sheet amounts.

A Recoverable Amount Test for Balance Sheet Amounts

Companies invest in assets in the expectation of achieving a return which equals or exceeds the cost of capital on the capital invested. Such expectations relate to multiple periods, and the outcome of a single period can provide only limited information. Yet it is in the nature of corporate reporting that single period accounts are the main mechanism by which results are monitored and investor expectations are reviewed.

Assumptions that single period reports can be useful in such roles underlie market price accounting models. In the case of NRV accounts an annual return which is less than the cost of capital on NRV equity would signal that shareholders may be better served by dismembering the business. For accounts on a pure replacement cost basis a return on net assets of less than the cost of capital would signal that the company's assets may not be worth replacing. For CC accounts the 'value to the firm' rule would apply: an inability to earn the cost of capital implies that assets are overvalued and should be reduced to PV or NRV as appropriate.

The parallel has already been drawn between the 'value to the firm' rule in CC accounts and the recoverable amount rule in HC accounts. Both require that assets should be written down in the face of evidence that the worth of assets is below that shown in the accounts. The most compelling evidence is provided by the achieved income of the firm. A test based on reported income has the distinct advantage of being transparently based on disclosed and achieved results, rather than on undisclosed and potentially self-interested managerial expectations.

Consequently the recoverable amount rule can be used to provide a simple overall test of balance sheet amounts in HC accounts. If income of the current period is less than that required to meet the company's cost of capital on its net assets in the balance sheet, there is a presumption that book values are excessive and that asset reductions to recoverable amounts need to be made. In other words there is a signal for reductions to recoverable amount when:

$$Y < rE$$

where Y is reported income of the period; r is the company's equity cost of capital of the period; E is book value of the net assets of the company, equal to ordinary share capital and reserves.

It is evident that this is not a test of the recoverable amount of intangibles as such, but relates to the global asset/liability amounts of the company. That is in many respects an advantage, since intangibles are by no means the only area of potential valuation difficulty in accounts. The test would provide a diagnostic device[38] suggesting when a reduction to recoverable amount is needed. Intangibles, particularly goodwill, would be prime

---

[38] A similar rate of return test is developed in US Treasury Department (1989, pp. 94–102) to assess the validity of intercompany pricing.

Table 1
Application of 'recoverable amount' test

	Grand Metropolitan plc			*Guinness plc*		
	1986	1987	1988	1986	1987	1988
	£m	£m	£m	£m	£m	£m
Earnings for ordinary shares	273.1	312.5	412.0	203.0	257.0	325.0
3-year average of extraordinary items	(1.0)	49.4	136.4	(46.4)	27.8	35.6
Income for recoverable amount	272.1	361.9	548.4	156.6	284.8	360.6
Ordinary share capital and reserves (average of the period)	2087.6	2242.8	2863.7	1177.5	1999.0	2352.0
Achieved rate of return	13.0%	16.1%	19.2%	13.3%	14.2%	15.4%
Estimated cost of capital	18.3%	18.3%	18.0%	18.0%	17.6%	17.4%
Excess or (shortfall) returns	(5.3%)	(2.2%)	1.2%	(4.7%)	(3.4%)	(2.1%)
Amount of income shortfall	110.2	48.5	—	54.8	66.1	49.7

candidates but not necessarily the only assets for consideration.

The size of the required value adjustment on the strength of a single period's results is a matter of judgment. At one extreme it might be assumed that the income shortfall would continue in perpetuity. In that case assets would need to be reduced by the income shortfall multiplied by the reciprocal of the company's long-term cost of capital. At the other extreme, a view that the shortfall is merely a temporary variation could leave asset values unchanged. A simple compromise would suggest that assets should be reduced by the current year's income shortfall. This is unlikely to produce a very substantial adjustment (relative to net assets) in any single year, and would provide an implicit averaging process. For example, if asset value is £100 m, cost of capital is 20 per cent and income is £19 m, assets would be reduced by the £1 m income shortfall to £99 m. If the shortfall were permanent, it would take five years for the assets to be reduced to their corresponding permanent value of £95 m.

Such iterative adjustments would provide a clear structure for dealing with diminution in asset value. On the other hand, the prudence approach of HC implies that a subsequent income excess would not in itself lead to an upward revaluation; the capitalisation of new assets would provide the source for changes of that nature.

Application of the Recoverable Amount Test in HC Accounts

The recoverable amount test was applied to the accounts of Grand Metropolitan plc and Guinness plc for the three years to 1988. These companies were chosen because in 1988 they both capitalised large amounts of brand names which had previously been written off against reserves, and because both companies provided accounting summaries for prior years reflecting the change in accounting policy.[39] Thus it was possible to backtrack to calculate achieved rates of return.[40]

Table 1 shows the calculations for the recoverable amount test. Earnings for ordinary shares (after tax and preference dividends) provide the starting point for income. An average of extraordinary items over the preceding three years is then added/deducted,[41] on the grounds that although these elements form part of comprehensive income some variability should be eliminated. The income total is divided by the average ordinary share capital and reserves of the period to give an achieved rate of return. This return is then compared with the cost of equity capital, estimated on a capital asset pricing model basis.[42] The difference is the excess or shortfall of returns.

---

[39] Grand Metropolitan's adjusted asset amounts went back to 1985. Opening and closing values were needed for averaging in the rate of return calculation, so 1986 was the first year for which a relevant rate of return could be calculated. 1986 was also the first year for Guinness after the completion of the Distillers merger. Consequently the years 1986, 1987 and 1988 provided appropriate illustrative years for both companies. Guinness had a 15-month accounting period in 1986, but 12-month numbers were provided in the 5-year financial summary ending 1988.

[40] One of the referees to this paper points out that the Guinness income will be affected by the Takeover Panel's ruling that Guinness must pay £85 m as additional consideration to the former shareholders of Distillers. Conversely Guinness will benefit from anticipated repayments of some £40 m on its investment in CX Partners (a fund managed by Ivan Boesky) which were written off from its 1986 accounts. However, neither of these future items affects the calculations in this paper, which are solely concerned with reported income.

[41] For this purpose extraordinary items were indexed (using the Retail Price Index) from the middle of the accounting period in which they occurred to the middle of the accounting period in which they were included for the income calculation. This was consistent with the averaging process applied to earnings for ordinary shares and ordinary share capital and reserves. Further details of the calculation bases are obtainable from the author.

A shortfall shows that the company is not earning its cost of capital on the book value of its net assets. This implies that assets are overstated relative to recoverable amount, and that a reduction is appropriate. The amounts of the income shortfalls are calculated by applying the shortfall percentage to the amount for ordinary share capital and reserves. It was suggested earlier that these amounts for the current year income shortfall could be used for iterative reductions of asset values, in the absence of more explicit evidence.

The recoverable amount test is based on very broad assumptions and it is evident that any single year's numbers must be treated with caution. However, successive shortfalls provide increasingly clear signals that adjustments need to be made.

Conclusions

The treatment of intangibles in accounts is in an evolutionary state. It is unlikely that difficulties in this area will be swiftly resolved, particularly where they arise from limitations of the HC model which apply equally to tangible assets. However, there are a number of steps which could be taken towards a principled approach to intangible asset reporting, and the main suggestions made in this paper can be summarised as follows:

1. The adoption of a definition of separable intangibles as entailing legal rights to economic benefits in relation to persons at large.
2. The recognition of internally developed separable intangibles on bases consistent with the recognition of purchased separable intangibles.
3. The use of capitalisation weighted for the probability of recovery, and the provisional capitalisation of costs on this basis (in HC or CC accounts) for separable intangibles in circumstances where economic benefits had not yet been established with sufficient reliability for full capitalisation.
4. The recording of intangibles at amounts consistent with the accounting model in use, and in particular the avoidance of selective revaluations (of the sort currently in use in the UK) which give rise to a mixture of measurement bases in accounts.
5. The consistent recognition in HC accounts of transactions which augment assets under the HC model, and specifically the recognition of purchased goodwill regardless of whether a combined enterprise is regarded as having arisen from merger or acquisition.
6. The adoption of a test of the overall magnitude of intangibles recorded in accounts, which would provide the basis for adjustments to the recoverable amount of assets.

References

AARF, *Exposure Draft 49, Accounting for Identifiable Intangible Assets*, Australian Accounting Research Foundation, 1989.

AARF, *Statement of Accounting Standards 18, Accounting for Goodwill*, Accounting Standards Board and Australian Accounting Research Foundation, 1984.

AARF, *Accounting Guidance Release 5, Accounting for Intangible Assets Recognised in Accordance with Statement of Accounting Standards AAS18 'Accounting for Goodwill'*, Australian Accounting Research Foundation, 1985.

APB, *Opinion of the Accounting Principles Board 17, Intangible Assets*, American Institute of Certified Public Accountants, 1970.

ASC, *Exposure Draft 42, Accounting for Special Purpose Transactions, Current Cost Accounting*, Accounting Standards Committee, 1988.

ASC, *Exposure Draft 47, Accounting for Gooodwill*, Accounting Standards Committee, 1990.

ASC, *Exposure Draft 48, Accounting for Acquisitions and Mergers*, Accounting Standards Committee, 1990.

ASC, *Statement of Standard Accounting Practice 12, Accounting for Depreciation*, Accounting Standards Committee, (revised) 1987.

ASC, *Statement of Standard Accounting Practice 16, Current Cost Accounting*, Accounting Standards Committee, 1980.

ASC, *Statement of Standard Accounting Practice 22, Accounting for Goodwill*, Accounting Standards Committee, 1984.

ASC, *Statement of Standard Accounting Practice 23, Accounting for Acquisitions and Mergers*, Accounting Standards Committee, 1985.

ASC, *TR738, Statement of Provisional Views on Accounting for Intangible Assets with Special Reference to Brands*, Accounting Standards Committee, 1989.

ASC, *TR780, Accounting for Intangible Fixed Assets*, Accounting Standards Committee, 1990.

---

[42] Cost of capital r has been estimated in accordance with CAPM where $r = rf + \beta(rm - rf)$. The calculations take rf as the average gross redemption yield for long-dated (20 years) British government securities. Betas are taken from Datastream, which were assumed stable and were chosen as being lower (and therefore producing less unfavourable results) than those of the London Business School Risk Measurement Service. The risk premium $rm-rf$ is taken as 8.4% from the Brealey and Myers (1988) reference to an average premium of 8.4% over the past 60 years. Thus cost of capital for each period is determined.

	Grand Metropolitan			Guinness		
	1986 %	1987 %	1988 %	1986 %	1987 %	1988 %
Average long term interest rate	9.8	9.8	9.5	9.9	9.5	9.3
Risk premium 8.4% times beta	8.5	8.5	8.5	8.1	8.1	8.1
Cost of capital	18.3	18.3	18.0	18.0	17.6	17.4

Abdel-khalik, A. R., 'Advertising Effectiveness and Accounting Policy', *Journal of Accounting Research*, October 1975, pp. 657–670.

Barwise, P. Higson, C., Likierman, A. and P. Marsh, *Accounting for Brands*, London Business School, 1989.

Beaver W. H. and J. S. Demski, 'The Nature of Income Measurement', *Accounting Review*, 1979, pp. 38–46.

Brealey, R. A. and S. C. Myers, *Principles of Corporate Finance*, 3rd edition, McGraw-Hill, 1988.

Campbell, L. G., *Accounting for Brands*, Institute of Chartered Accountants of Scotland, 1989.

Catlett, G. R. and N. O. Olson, *Accounting for Goodwill, Accounting Research Study 10*, American Institute of Certified Public Accountants, 1968.

Chambers, R. J., *Accounting, Evaluation and Economic Behavior*, Prentice-Hall, 1966.

Edwards, E. O. and P. W. Bell, *The Theory and Measurement of Business Income*, University of California Press, 1961.

Edwards, J., Kay J. and C. Mayer, *The Economic Analysis of Accounting Profitability*, Clarendon Press, 1987.

Ernst and Whinney, *The 1988 Companies Bill*, Ernst and Whinney, 1989.

Falk, H. and J. C. Miller, 'Amortization of Advertising Expenditures', *Journal of Accounting Research*, Spring 1977, pp. 12–22.

Griffiths, I., *Creative Accounting*, Sidgwick and Jackson, 1986.

Gynther, R. S., *Accounting for Price Level Changes: Theory and Procedures*, Pergamon, 1966.

Hendriksen, E. S., *Accounting Theory*, 4th edition, Irwin, 1982.

Hirschey, M. and J. J. Weygandt, 'Amortization Policy for Advertising and Research and Development Expenditures', *Journal of Accounting Research*, Spring 1985, pp. 326–335.

IASC, *Proposed Statement: Framework for the Preparation and Presentation of Financial Statements*, International Accounting Standards Committee, 1988.

IASC, *Exposure Draft 32, Comparability of Financial Statements*, Proposed Amendments to International Accounting Standards 2, 5, 8, 9, 11, 17, 18, 19, 21, 22, 23 and 25, International Accounting Standards Committee, 1989.

Kohler, E. L., *A Dictionary for Accountants*, 3rd edition, Prentice-Hall, 1963.

Lee, T. A., *Cash Flow Accounting*, Van Nostrand (UK), 1984.

Leo, K., 'Accounting for the Value of Brands—A Comment', *Accounting Research Journal*, Autumn 1989, pp. 31–34.

Meeks, G., *Disappointing Marriage: A Study of the Gains from Merger*, Cambridge University Press, 1977.

Miller, M. C. and M. A. Islam, *The Definition and Recognition of Assets, Accounting Theory Monograph 7*, Australian Accounting Research Foundation, 1988.

NZSA, *Exposure Draft 43, Accounting for Intangibles*, New Zealand Society of Accountants, 1988.

Palda, K. S., 'The Measurement of Cumulative Advertising Effects', *Journal of Business*, 1965, pp. 162–179.

Parker, R. H., Harcourt G. C., and G. Whittington, *Readings in the Concept and Measurement of Income*, 2nd edition, Philip Allan, 1986.

Peasnell, K. V., 'Technological Change and Other Aspects of the Definition of Replacement Cost for Managerial Purposes', in J. Klaassen and P. Verburg (eds.), *Replacement Costs for Managerial Purposes*, North-Holland, 1984, pp. 170–206.

Picconi, M. J., 'A Reconsideration of the Recognition of Advertising Assets on Financial Statements', *Journal of Accounting Research*, Autumn 1977, pp. 317–326.

Rank Hovis McDougall Plc, *Brands on the Balance Sheet*, Rank Hovis McDougall Plc, 16 January 1989.

Revsine, L., *Replacement Cost Accounting*, Prentice-Hall, 1973.

Rutteman, P., 'Boosting the Profits of the Brands Industry', *Accountancy*, January 1990, pp. 26–27.

Scapens, R. W., 'A Neoclassical Measure of Profit', *Accounting Review*, 1978, pp. 448–468.

Securities Institute of Australia, *Submission on ED49 Accounting for Identifiable Intangible Assets*, Securities Institute of Australia, 1989.

SFAC 5, *Statement of Financial Accounting Concepts No. 5, Recognition and Measurement in Financial Statements of Business Enterprises*, Financial Accounting Standards Board, 1984.

SFAC 6, *Statement of Financial Accounting Concepts No. 6, Elements of Financial Statements*, Financial Accounting Standards Board, 1985.

Solomons, D., *Guidelines for Financial Reporting Standards*, Institute of Chartered Accountants in England and Wales, 1988.

Sterling, R. R., *Theory of the Measurement of Enterprise Income*, University of Kansas Press, 1979.

Thomas, A. L., *The Allocation Problem in Financial Accounting Theory*, Studies in Accounting Research No. 3, American Accounting Association, 1969.

Thomas, A. L., *The Allocation Problem: Part Two*, Studies in Accounting Research No. 9, American Accounting Association, 1974.

Tweedie, D. and J. Blanchet, 'Brands, Goodwill and the Balance Sheet', *Accountancy*, January 1989, pp. 20–22.

Tweedie, D. and G. Whittington, *The Debate on Inflation Accounting*, Cambridge University Press, 1984.

US Treasury Department and US Internal Revenue Service, *A Study of Intercompany Pricing*, Discussion Draft, October 18, 1988, Commerce Clearing House, 1988.

Watts R. L. and J. L. Zimmerman, 'Towards a Positive Theory of the Determination of Accounting Standards', *Accounting Review*, 1978, pp. 112–134.

Watts, R.L. and J. L. Zimmerman, *Positive Accounting Theory*, Prentice Hall, 1986.

Whittington, G., *Inflation Accounting: An Introduction to the Debate*, Cambridge University Press, 1983.

Accounting and Business Research, Vol. 20, No. 79, pp. 206–210, 1990

The Management of Currency Risk: Case Studies of US and UK Multinationals

P. Collier, E. W. Davis, J. B. Coates and S. G. Longden*

Abstract—This paper presents a case study analysis of currency risk management practice in large British and American multinational companies undertaken to extend findings obtained in a preliminary survey of 51 British multinational companies. The extension examines the behaviour of American as well as British companies, not just in terms of transaction risk but with reference to translation risk as well, and focuses upon the extent of risk neutrality. Case study analysis allows interviewers to evaluate differences in behaviour which may help to explain policies adopted.

Introduction

This paper presents a case study analysis of currency risk management practice in large British and American multinational companies undertaken to extend findings obtained in a preliminary survey of 51 UK multinational companies (Collier and Davis, 1985). The extension examines the behaviour of US as well as UK companies not just in terms of transaction risk but also with reference to translation risk and focuses upon the extent of risk neutrality in policies adopted.

The case study methodology was chosen because it affords a degree of detail, and nuance of interpretation, which may afford a deeper insight into actual behaviour than that possible in surveys alone. A specific element of its superiority arises from the ability to record reasons behind corporate policies adopted, and, in particular, to identify the explanation for differences in such policies. The generally recognised disadvantage which case study based research entails is of course that of external validification. This however should not restrict its use in what Mohr (1985) described as "associational" research, in which it is not so much a general causal law with which one is concerned, even a law that is highly contingent, but a limited association. In Mohr's terms, therefore, associational research may help to explain variables in a limited population, for example, currency risk management by a necessarily restricted group of large multinational firms.

Selection of case study firms

The basis of this present research is information built up from interviews[1] conducted in 23 large multinational companies (out of 27 approached), comprising 11 UK firms and 12 comparable companies in the USA (Table 1). All such firms had significant overseas business and substantial elements of foreign exchange exposure. The fact of transnational differences in itself is not necessarily one which we would expect to have a substantial effect on behaviour, given that we are dealing with generally large publicly quoted *international* firms. The cases are denoted by number and a letter—1 to 11 A for UK and 1 to 12 B for US companies. They are published in Collier *et al.* (1990).

Policies towards transaction risk arising from differences in attitudes to risk

Previous research by Rodriguez (1981) found evidence that US treasurers emphasised the defensive nature of currency risk management, embracing a generally asymmetric attitude to risk, expressed in terms of greater willingness to avoid open long positions in weak currencies than to exploit long positions in strong currencies. The contextual justification for such research follows the market imperfections approach and probes the critical assumption that firms do not have a risk neutral attitude to currency hedging (see, for example, Glaum, 1988; Dufey and Srinivasulu, 1983).

This analysis of transaction risk management by US and UK multinational companies relates their

---

*The authors are, respectively, lecturer in accountancy at the University of Exeter, Lloyds Bank Professor of Business Finance at Aston Business School, senior lecturer at Aston Business School, and lecturer at Aston Business School. They gratefully acknowledge the support of the Institute of Chartered Accountants in England and Wales. They also record their appreciation for the comments of anonymous referees.

Table 1. Case study companies analysed by *Times* and *Fortune* position

UK	*Number of Companies*	*Average Turnover £ billion*	*Average Net Assets £ billion*
Times Top 50	4	12.9	8.6
Times 51–100	4	1.6	1.1
Times 101–200	3	0.6	0.5
Overall total and averages	11	5.4	3.7

US	*Number of Companies*	*Average Turnover $ billion*	*Average Net Assets $ billion*
Fortune Top 50	5	16.9	12.4
Fortune 51–100	4	4.3	3.1
Fortune 101–200	3	1.3	0.9
Overall total and averages	12	8.8	6.4

[1] For the purposes of the research interviews, the discussions were conducted using the definitions of transaction and translation exposure carried in *Foreign Currency Exposure and Risk Management*, (*IFAC*, 1987).

policy towards that risk to interviewers' perceptions of the risk profile of the company's currency flows, and follows the Collier and Davis (1985) derivation. The starting point was to observe the policy approach to the significant portion of the transaction risk. From this the following policy stances can be identified: (a) close out (resort to hedging by various means) and (b) actively manage (the decision to hedge is discretionary). The first group may be construed to represent organisations which are risk averse in currency exposure terms while the second group comprises those cases which approximate towards risk neutrality.

Risk averse attitudes to transaction risk

In the former group, and within the UK, the reasons given by companies generally referred to the view that the business was inherently profitable and therefore currency risk management was essentially defensive with the main objective being the avoidance of significant losses. Companies in this category valued certainty as to the sterling value of costs and revenues denominated in foreign currency and were not interested in seeking additional profits from currency risk management. In the US case studies a similar number of corporations followed a risk averse position. For this group the role of the treasurer was universally perceived as the control and minimisation of the risk arising from business decisions. In particular 1B, 4B and 10B strongly asserted this position and felt that it was not part of a treasurer's role to out-predict the market. Corporation 7B also followed this line but emphasised the need for any positions taken in the market to be justifiable in terms of normal currency flows. Indeed 7B defined as speculative any hedge which was 'not coincident with a specific transaction in terms of amount, timing and currency'.

Risk neutral attitudes in currency transaction exposure

The second group comprised cases which exhibit varying degrees of willingness to move from a risk averse stance towards risk neutrality. Examples in the UK of more risk neutral approaches in companies include 1A, which exposes currency flows from certain businesses on the grounds that they provide 'a portfolio of currency which diversify the group's currency risk' and is prepared to manage currency flows with a view to optimising the sterling return from them. Further, 6A with the benefit of high margins was an active manager of currency flows in order to profit from currency movements; while 8A and 2A managed flows up to over a year forward. The US corporations interviewed appeared generally less willing to take positions.

A further dimension to the understanding of the differences between the UK and US approaches might be provided by a comparison of policy in relation to the perceived riskiness of their currency flows. Table 2 shows that in the UK and the US 3 out of 4 companies in the high risk category adopted a close-out strategy.

Of particular interest is the relatively high proportion (8 out of 19) of companies classified as low risk which preferred to close out transaction risk and did so more or less irrespective of their country

Table 2. Relationship between risk and currency transaction management policy for US and UK study companies

	UK			*US*			*Overall*		
Policy	*High Risk*	*Low Risk*	*Total*	*High Risk*	*Low Risk*	*Total*	*High Risk*	*Low Risk*	*Total*
Close-out	1	3	4	2	5	7	3	8	11
Actively manage	1	6	7	—	5	5	1	11	12
	2	9	11	2	10	12	4	19	23

of origin. That the majority of companies classified as having low transaction risk did actively manage such exposures is to be expected, consistent with the findings of Collier and Davis (1985).

The management of translation risk by US and UK case study companies

Since 1981, when FAS 8 was replaced by FAS 52, accounting practice for foreign currency financial statement translation has been similar in the UK and US (in both countries the financial statements of overseas entities are translated upon consolidation using the closing rate method with gains or losses arising being reflected in the reserves). Despite the conclusions of empirical work (summarised by Griffin, 1979) to the effect that it is illogical for multinationals to manage translation risk, several of the US corporations cited FAS 8 as the catalyst to formalised currency risk managment even though thirteen years has elapsed since the standard was issued. 8B and 12B confirmed that losses caused by applying FAS 8 were the major spur to foreign exchange management; while 9B reported FAS 8 as the major reason for setting up a multi-currency netting system. Finally, 3B and 5B emphasised the need to hedge translation risk under FAS 8 in order to protect the income statement and stated that a more passive stance had been taken to managing translation exposure since its replacement.

Although it was generally agreed among case study companies that translation exposure managment was a lesser concern, there were two main contrasting approaches. The first is represented by companies who argued, following Glaum (1988), that translation risk does not 'render useful information to the corporate financial manager and its application can lead to harmful decisions', that it was undesirable to spend cash on and risk losses to defend against reserve movements ('paper profits'). The alternative view was that translation exposure was a real risk which affected the reserves of the company. UK companies like 2A and 5A and US corporations like 2B, 3B and 8B supported the former position and did not manage translation exposure; while UK companies like 1A, 3A and 10A and US corporations like 4B, 7B and 10B managed the exposure to varying degrees. The stated reasoning behind translation exposure management varied. 4A perceived distributable reserves as a key element in financial strategy, since management believed them to be the best surrogate for the long run value to the shareholders of a stake in the group; therefore adverse impacts must be minimised. 7A managed the exposure in order to protect gearing ratios; 10A aimed to provide 'a truer reflection of the underlying values in the group balance sheet' and 9A wished to present a UK balance sheet. Other companies, like 7B, 6A and 8A reported a willingness to optimise the consequences of having a portfolio of currency investments by exposing net worth in strong currencies and covering net worth in weak currencies.

Risk aversion among US corporations on translation risk

Within the range of corporate policies towards translation exposure, Table 3 distinguishes between 'managers and non-managers', with managers being categorised as either (a) close out (attempt to fully cover translation exposure as far as is practical) or (b) actively manage (willing to manage positions to a degree in order to benefit from the impact of exchange rate fluctuations on net worth). This classification is linked to an assessment of the riskiness of the translation position of the firms. The surrogate used for this is the portion of net worth exposed with a cut off point between high and low risk set arbitrarily at 25% of net assets situated abroad.

The table shows that there were two areas of possible difference between the approach to translation risk management in the UK and US. Although the validity of cross-national comparison is inevitably restricted to the specific firms observed, UK companies visited appeared rather more willing to manage translation risk than their US counterparts. Second, those US corporations, which decided to manage the exposure seemed rather more risk averse than UK companies. Given the numbers involved, the value of any such comparison lies less in the absolute differences involved, than in the explanations for behaviour offered in interview. Of the seven US corporations

Table 3. Relationship between risk and translation exposure policy for case study companies

Policy	UK High Risk	UK Low Risk	UK Total	US High Risk	US Low Risk	US Total	Overall High Risk	Overall Low Risk	Overall Total
Unmanaged	2	0	2	3	2	5	5	2	7
Managed									
Close-out	2	2	4	4	2	5	6	4	9
Actively manage	5	0	5	1	0	2	6	0	7
	9	2	11	8	4	12	17	6	23

managing the exposure, most followed defensive strategies to minimise the impact of currency fluctuations on reserves. By comparison UK companies visited were almost equally split between risk averse and risk neutral positions towards covering this exposure. The majority of the case studies fall within the high risk classification. Table 3 suggests that there is no connection between a decision not to manage translation risk and the risk profile. However, it is clear that where the risk is low, there is no inclination to manage the exposure, probably because the impact of successful strategies on reserves would be immaterial.

The relationship between policies on transaction and translation risk

Comparison of Tables 2 and 3 considers the implication of an asymmetric attitude to transaction and translation exposure. In low risk transaction exposure situations, 8 out of 19 companies closed out the risk involved, while 4 of the 6 companies characterised as having low risk translation exposure closed out such risk. Interviewees pointed out that one major factor explaining these apparently contradictory policy stances was the magnitude of the risk. Transaction risk reflects all foreign denominated cash flows in a given period and obviously exceeds many times the value of translation exposure which is merely the exposed foreign currency net worth. Therefore management in low risk situations prefer to close-out translation risk as the costs are minimal, as are potential rewards from active management. In contrast, where translation risks are high active management is worthwhile and the amounts at risk are still not significant in transaction exposure terms.

This view is reinforced by examining the consistency of managements' policy to transaction and translation risk, as illustrated in Table 4.

If combinations of 'close out transaction and close out translation' and 'actively manage transaction and actively manage translation' are deemed to be consistent behaviour then 6 out of 9 UK companies and 4 out of 7 US corporations exhibit a congruent pattern. In the case of the three UK exceptions (3A, 7A and 1A) there is no clear link as to why the behaviour varies although 7A was a conservative active manager and therefore a close out approach to translation risk is not wholly unexpected. In the US context, those at variance have distinct positions. 5B and 12B which close out translation risk whilst managing transaction risk actively have a low level of translation risk. The other US corporations with a low translation risk either close out or ignore the exposure. Nevertheless the results suggest that amongst the majority of the multinationals interviewed there is a consistent pattern of policy towards transaction and translation exposure.

Conclusion

The cases generally support previous findings to the effect that where transaction risk was high firms generally adopted a close-out policy. Further, and supporting the previous findings of Rodriguez (1981) to this effect, the US firms interviewed

Table 4. Comparison of the policies on transaction and translation risk

Transaction	Risk Policy	UK Translation Close Out	UK Translation Actively Manage	UK Translation Total	US Translation Close Out	US Translation Actively Manage	US Translation Total
	Close Out	2	1	3	3	1	4
	Actively Manage	2	4	6	2	1	3
		4	5	9	5	2	7

exhibited policies which were slightly more inclined towards asymmetric risk aversion, even where the overall risk profiles were similar. Here, it is worth noting the view of three US treasurers that the fact that US corporations are subject to quarterly reporting of published accounts would make them less disposed to risk taking on currency transactions for fear of the impact of currency losses on their published income statement.

Extension of the case study analysis to translation risk suggests that a significant number of the large multinationals interviewed, particularly in the UK, act in contradiction to the traditional efficient markets view of the necessity for hedging translation exposure. What this implies is that multinationals undertaking translation hedges may partially frustrate investment preferences of their investors, or if we accept the strong form of the EMH, at least incur unnecessary costs. That view certainly was put by some of the multinationals investigated as a deliberate reason why such a policy had been ruled out for their organisation.

The final conclusion is methodological. What this research set out to achieve was a study of conformity and divergence from risk neutrality in currency management by large multinationals. The research draws directly from parameters established in previous surveys but does so for a restricted population. Case studies offer the opportunity to go behind pure statements of actions and policies: the philosophy, views and reasons underlying them can be explored directly with very senior managers.

References

Collier, P. A. and Davis, E. W. (1985), 'Currency Risk Management in UK Multinational Companies', *Accounting and Business Research*, Autumn, pp. 327–335.

Collier, P. A., Davis, E. W., Coates, J. B. and Longden, S. G. (1990), *Multinational Companies and the Management of Currency Risk*, Prentice-Hall.

Dufey. G. and Srinivasulu, S. L. (1983) 'The Case for Corporate Management of Foreign Exchange Risk', *Financial Management*, Winter, pp. 54–62.

Financial Accounting Standards Board (1975), *Statement of Financial Accounting Standards No. 8: Accounting for the Translation of Foreign Currency Translations and Foreign Currency Financial Statements.*

Financial Accounting Standards Board (1981), *Statement of Financial Accounting Standards No. 52: Foreign Currency Translation.*

Glaum, M., (1988), *The Management of Foreign Exchange Risk in Multinational Corporations*, LUBC Research Monograph, Loughborough.

Griffin, P. (1979), *FASB Statement No. 8: A Review of Empirical Research on its Economic Consequences*, Stanford University Research Report No. 482.

Mohr, L. G. (1985), 'The Reliability of the Case Study as a Source of Information', in Coulan, R. and Smith, R. (eds). *Advances in Information Processing in Organisations*, Vol. 2, JAI Press.

Rodriguez, R. M. (1981), 'Corporate Exchange Risk Management: Theme and Aberrations', *Journal of Finance*, pp. 427–439, May.

Accounting and Business Research, Vol. 20, No. 79, pp. 211–221, 1990

Managerial Accounting Early in the British Industrial Revolution: The Carron Company, a Case Study

Richard K. Fleischman and Lee D. Parker*

Abstract—Traditional accounting histories date the advent of sophisticated cost accounting to the mid-1880s. Research in recent years, however, has provided evidence of purposeful cost management during the British Industrial Revolution. Given the advances in capital accumulation techniques, market structure development, and technology, it might have been expected that British entrepreneurs would have appreciated the advantages that effective costing could provide. This article is a case study of the Carron Company, the huge Scottish ironworks, whose cost accounting methods were notably innovative during the period for which plentiful archival records exist: 1759–1786. Carron's utilisation and practice of cost management is examined in the areas of expenditure control; responsibility and departmental cost management; overhead allocation; cost comparisons and transfers; costs for decision-making; budgets, forecasts, and standards; and inventory control. The positive findings in all these activity areas contribute to the growing rehabilitation of British Industrial Revolution cost accounting as a precursor of 'the costing renaissance' a century later.

The entrepreneurs of the British Industrial Revolution manifested outstanding sophistication in a great variety of economic fields, ranging from technological expertise to capital accumulation to the development of marketing structures. Yet, traditional accounting histories (Chatfield, 1977, pp. 101–105; Edwards, 1937, p. 255; Garner, 1954, pp. 28–30; Littleton, 1933; p. 322; Solomons, 1952, pp. 16–17) universally reject the notion that meaningful managerial accounting was practised during the period. The 'costing renaissance', the advent of mature cost accounting techniques, has been dated from the age of Frederick Taylor and the scientific management movement in the United States circa 1885. The dearth of an English language costing literature before Garcke and Fells (1887) has caused most observers to assume the nascent state of managerial accounting before that date. The numerous eighteenth and early nineteenth century textbooks dealt almost exclusively with merchant accounting techniques. A notable exception was Robert Hamilton's *An Introduction to Merchandize* (1st ed. 1777/79) though even here facets of the integrated process costing system he described were apparently deleted from later editions of the work (Mepham, 1988, p. 308; 1988a, p. 56).

Given the economic advances on so many other fronts, it is counter-intuitive to think there was no purposeful managerial accounting occurring in major Industrial Revolution enterprises. It has been suggested that profit margins were so extensive that entrepreneurs did not have to be concerned about the savings that superior costing could provide (Edwards, 1937, p. 283; Parker, 1969, p. 19; 1986, p. 41; Pollard, 1965, p. 245; Wells, 1977, p. 47). Strong evidence, however, supports the contrary view that competition was extremely intense, particularly in the dominant textile and iron industries (Pollard, 1965, p. 246).

Some observers have argued that there were cost accounting beginnings, but that these efforts were too primitive, simplistic, or unsophisticated to have been of much value. Shortcomings included an inability to allocate fixed costs, a failure to separate owner and enterprise transactions, and the hopeless inaccuracy of product costing techniques (Chatfield, 1977, p. 104; Edwards, 1937, p. 255; Wells, 1977, p. 47; Yamey, 1949, p. 111). Others have maintained that an adequate integration of cost and commercial accounts awaited the development of a greater organisational complexity in which material cost transfers between departments could occur (Chatfield, 1977, p. 103; Johnson, 1972, p. 467).

In the last two decades, however, there has been considerable rehabilitation of Industrial Revolution managerial accounting, though the tradition really started sixty years ago with Roll's study of Boulton and Watt (1930). However, his evidence of sophisticated cost management was apparently

---

*The authors are respectively associate professor and chairman of accounting, John Carroll University, Cleveland, Ohio, and professor of accounting and finance, The Flinders University of South Australia. They wish to express gratitude to Arthur Andersen & Co. for funding without which this project would not have been possible. They also wish to thank two anonymous reviewers of *Accounting and Business Research* for their helpful suggestions.

dismissed as the exceptional methodology of a single firm. More recently, McKendrick's work on Wedgwood (1970) and Stone's on the Charlton Mills (1973) have chronicled further individual examples of superior costing. Johnson's discovery of advanced cost management at the Lyman Mills in New England in the 1850s suggests that similar methods might have existed at UK textile mills of an earlier vintage (Johnson, 1972, p. 469; Johnson and Kaplan, 1987, pp. 21–31). Jones' survey of Welsh Industrial Revolution accounting (1985) and J. R. Edwards' recent *Accounting and Business Research* article (1989), placing Jones' work into the wider context of revisionist developments, have been encouraging. Research in Scottish accounting history likewise affords promise of further reassessment. Even though Brown (1905), the Edinburgh accountant, did not even mention industrial accounting in his narrative history of the profession, recent study of the Newmills Cloth Manufactory, Haddington records has uncovered the utilisation of costing for process evaluation, product line decisions, raw material control and 'rational planning' as early as the late seventeenth century (Marshall, 1980, pp. 142, 156, 158, 167, 172, 174).

Not only was Industrial Revolution cost accounting literature meagre, there was no organised professsion in Scotland until 1854, there was virtually no accounting education (Stacey, 1954, pp. 11–12),[1] and there were certainly no standardised accounting conventions or methodologies (Yamey, 1960, pp. 22–23). Even apart from the absence of structures in the environment to support the spread of cost accounting, the desire for competitive advantage would have mandated secrecy about cost management techniques in any event (Garner, 1954, p. 30; Urwick and Brech, 1964, p. 21; Wells, 1977, p. 48; 1978, p. 62). Consequently, the pattern was necessarily one of multiple developments. We hypothesise that in many cases a cost accounting methodology was not devised by individuals hired to perform an accounting function, but was developed by the entrepreneurs themselves who instinctively understood its advantages.

Few accounting historians have widely examined the surviving business records of the Industrial Revolution period. Much of the secondary source material about leading firms has been written by economic historians. Because they have different agenda, the accounting treatment contained in these business studies varies greatly in terms of detail and understanding. Pollard was one economic historian who coupled an awareness of accounting with an extensive investigation of Industrial Revolution business records. The high esteem Pollard commands in the UK has impaired the rehabilitation movement since he concluded in *The Genesis of Modern Management* (1965, p. 248) that 'the practice of using accounts as direct aids to management was not one of the achievements of the British Industrial Revolution'.

Solomons (1952, p. 8) argued that the British had not lived up to the expectation of world leadership in the development of cost management techniques. Many prominent accounting historians remain sceptical that any significant managerial accounting existed despite the two decades of Industrial Revolution managerial accounting revisionism. Parker (1986, pp. 41–42), in his recent monograph on the development of the accounting profession in Britain, has not altered the cost accounting chronology he advanced earlier (1969, p. 19).

The case study which follows traces the eighteenth century activities of the Carron Company, a firm that utilised superior cost management during the Industrial Revolution. Compared to other large firms, there are more extant records for Carron, though substantially less than a complete file. Evidence of cost accounting during the period is rarely found in financial accounting records. More fruitful are production reports, mineral field estimates, and minute books. The Carron partners met semi-annually in London (referenced General Court), and those who happened to be in the vicinity of Carron convened monthy (referenced Monthly). The bulk of this archival material is located at West Register House, Edinburgh. Since Carron was absentee-owned during its early years, a flow of correspondence rich in costing data for decision-making purposes passed between Scotland and Birmingham. These letters are contained in the Cadell papers at the National Library of Scotland, Edinburgh.

The history of the Carron Company during the Industrial Revolution can be divided into two distinct periods. From the initial founding of the firm in 1759 through 1786, plentiful business records survive. One of the original three founders, William Cadell, was the manager in residence at Carron. However, the real power in the firm was Samuel Garbett, a Birmingham inhabitant. The correspondence between the two was lively, although most communications from Cadell have not survived. In 1769, Charles Gascoigne became general manager at Carron, but the information remained bountiful as the General Court continued a committed, involved group.

As the company entered its second phase, Joseph Stainton (1786–1825) and Joseph Dawson (1825–1850) ruled the firm with an iron hand, soliciting virtually no input from other owners. Consequently, there developed a serious shortage of those types of records that provide useful information about cost utilisation and analysis. This declining evidence of managerial accounting in the later Industrial Revolution is not atypical and supports our contention that the dynamic founders of industrial enterprises provided the motivational spark. Sophisticated costing often did not survive them. An early British talent for cost accounting may have been lost during mid-Victorian times due to the dearth of a literature, the decline of British managerial acumen (Elbaum and Lazonick, 1984, pp. 568–9), and the limiting influence of entrenched family capitalism (Chandler, 1984, pp. 496–7).

---

[1] An anonymous reviewer of this article makes the point that 'there were many teachers of the Italian method of bookkeeping in both Edinburgh and Glasgow from the middle of the eighteenth century. It is unlikely that costing, as such, would have been on the syllabus but the textbooks often illustrated accounts for branches of trade.'

The definitive Carron Company history was written by Professor R. H. Campbell and appeared in 1961. Campbell was aware of the firm's accounting methods though his focus was more oriented toward the physical plant, products, markets, finances and partnership arrangements of Carron. We were fortunate to have had this resource as a point of reference.

The early Carron Company: a review

Carron Company began operations as a pioneer iron foundry in Scotland in 1759. The company was formed by a Scot, William Cadell, and two Birmingham industrialists, Samuel Garbett and John Roebuck. Carron was the first company to utilise ironstone from central Scotland and the first in Scotland to smelt iron with coke. It was the largest early Scottish operation of its type as evidenced by its physical dimensions. Carron product lines ranged from single cast iron products (pots and girdles) to ordnance, and included cast iron work for machinery, water pipes, grates, and fireplaces.

The early operation of Carron combined underutilised Scottish mineral resources with English skill and capital. The active founding partners and subsequent early proprietors of the enterprise reflected a general typology of eighteenth century British industrialists—outsiders possessing cash, energy, and organisational talent, but without any particular expertise or experience in the industry they were entering. Roebuck was a medical practitioner in Birmingham with an interest in chemistry. He had opened a laboratory and sulphuric acid plant with Garbett, a prominent merchant and businessman. Cadell was a merchant in Cockenzie who traded iron and timber on the Continent and built his own ships for that purpose (Hamilton, 1928, p. 186).

Carron Company had severe capitalisation problems in its early years because construction costs far outstripped anticipated amounts. Consequently, between the years 1760 and 1772, five individual partners (original and other subsequent entrants) and two associated private banks suffered bankruptcy or severe financial embarrassment. The company had to resort to desperate financial strategies to maintain liquidity including private bank loans, drafts, lines of credit, and sundry debts (Campbell, 1961, pp. 123–133).[2] The continuing financial problems of Carron over the 1760–1778 period were so severe that the company was fortunate to survive at all. This situation was complicated by early technical problems, such as cylinder boring inaccuracy and ordnance malfunctions. The development of the Carronade during the American War for Independence remedied Carron's long-standing financial difficulties and ensured its future survival.

Carron's economic and industrial environment

Eighteenth century English society conferred respectability upon both landowner and merchant. The latter group particularly benefited from increased involvement in manufacturing activities. A new class of capitalists arose in this period which encouraged inventiveness and business initiative. New industrial discoveries were exploited by businessmen drawn from the middle ranks of society. In partnership with inventors, these businessmen applied their capital, business acumen, and personal networks to promote a British transition from trade to industry (Briggs, 1959, pp. 24–27). The early proprietors of Carron fitted this mould.

Though born of a pre-existing mercantile network, most of the new industrial enterprises were small and highly localised. Carron Company was an atypically large Scottish industrial undertaking though self-contained between Stirling and Edinburgh. It marked the commencement of large-scale production in an industry that had previously been pursued only sporadically in Scotland. Even then, it was largely supported by English knowledge and capital (Briggs, 1959, pp. 19–22; Mackie, 1964).

Carron played an important role in the industrial transformation of Scotland. Natural coal resources were available to support a new iron manufacturing technology which included smelting with coke instead of charcoal and the utilisation of hot air instead of cold air blast in furnaces, allowing for the use of rich Scottish blackband iron ore. While most Carron Company land was held for building purposes before 1786, the firm purchased land subsequently to ensure supplies of raw materials and to avoid disputes with landowners over mining damage (Campbell, 1961, pp. 46–52; 1980, p. 18). A new link was forged between the fortunes of the coal and iron industries. The iron industry needed to be close to its raw materials and massed along the coalfields. The relationship between coal and iron was further cemented by the development of steam as the motive power in factories. This liaison heralded a period of considerable technological change in smelting, the puddling process for making bar iron, and steam power. Carron became the founding firm of the Scottish iron industry by virtue of its situation at a location where water power, coal, and iron were available together.

---

[2] The initial capitalisation and early financing of Carron lies beyond the scope of this paper. Campbell (1958; 1961) provides a complete paper and chapter on these subjects.

Securing adequate labour was also difficult for eighteenth century industry. The problem was evident in coalmining, for example, where the enforcement of the Scottish collier's serfdom did not cease finally until 1799. Carron responded to labour shortages by resorting to English miners at its own Quarole and Kinnaird coal fields (Campbell, 1961, pp. 30–31). Carron also endured inefficient labour, both in mines and furnaces. At one point in its early years, output only increased after the dismissal of certain inept furnace keepers (Campbell, 1961, pp. 34–53; 1980, p. 25). Such problems presented eighteenth century industrialists with the challenges of accumulating fixed capital, speeding production and distribution, securing adequate working capital, and managing both men and machines. A wide range of new management skills was necessary for success (Briggs, 1959, pp. 26–29).

The iron industry witnessed a massive rise in pig iron exports in the second half of the eighteenth century. The Napoleonic Wars of 1792–1802 occasioned a period of prosperity, with high levels of ordnance production at Woolwich, Enfield, and Carron. Iron sales were also stimulated by import limitations on iron supplies from Sweden and the Baltic, as well as by the growing number of commercial uses of iron (Briggs, 1959, p. 163). As a specialist iron producer Carron faced different marketing conditions from generalist producers of coal or iron. The specialist market was characterised by product differentiation which ran the risk that a market could suddenly be lost if the differentiated product was superseded in quality or type (Campbell, 1980, pp. 20–21). In Carron's case the founding partners were willing to experiment with new methods and technologies and thereby gained notoriety in Europe for innovation. By 1786, with this reputation established, experimentation declined. Carron's production of ordnance and shot became a highly profitable product through the American and Napoleonic Wars, as well as through peacetime sales to the East India Company and foreign governments (Campbell, 1961, pp. 87–94).

Cost management at Carron before 1800

The Carron Company records reveal plentiful examples of cost management, mostly centred in the 1759–1786 period during which time Cadell, Garbett, and Gascoigne were at the helm. Campbell (1961, pp. 136–8) has pointed out correctly the disarray of Carron's financial statements during these early years despite bountiful data on departmental costs. The firm's founders had great difficulty coping adequately with depreciation, inventory valuation, and the owners' capital accounts. Consequently, an interesting paradox arose. Previous to 1786, the Carron records reflected all the correct instincts about cost accounting methodologies but a failure to integrate costing with acceptable financial reporting. This shortcoming of Industrial Revolution accounting has been highlighted by subsequent observers (Chatfield, 1977, pp. 101, 103; Garcke and Fells, 1893, pp. 6–8). As the financial reporting improved in Campbell's view post-1786, evidence of this costing sophistication disappeared, but perhaps only as a function of the paucity of surviving records during the administrations of Stainton and Dawson.

Control of Expenditure

Consistent with the financial exigencies Carron Company experienced in its early years, its business records and partnership correspondence evidence an acute concern over the need to control operating expenses. It was a company convention dating from 1764 that any capital improvement of ten shillings or more required approval by a partner, and one in excess of twenty pounds had to be submitted for estimates and considered by all partners (General Court, GD 58/2/1/1, p. 89). In 1764, a General Court meeting of the Carron partners resolved to avoid every oncost (indirect) expense not absolutely necessary (General Court, GD 58/2/1/1, p. 157). Such concerns were reiterated by Cadell in a letter to Garbett dated 14 October, 1767: '... I do most heartily wish to see the utmost attention and economy established in every part of this undertaking...' (Cadell, ACC 5381, Box 28, Folder 1). Referring to the paucity of the firm's capital investment, Cadell again wrote to Garbett on 16 March, 1768, calling for every expense to be monitored with the 'utmost parsimony' due to the company's capital deficiency (Cadell, ACC 5381, Box 28, Folder 1).

This early concern with levels of expenditures was further demonstrated by the presentation to a 1763 General Court meeting of a detailed set of manufacturing costs for all products (General Court, GD 58/2/1/1, pp. 73–78). Additional available statistics appear to have prompted a letter of 4 July, 1766 from Garbett to Cadell, drawing attention to the high wastage of metal in the air furnaces (Cadell, ACC 5381, Box 28, Folder 1). An expense book for the Quarole Colliery for 1770–1772 contained receipts signed by recipients of cash with details of how the expense was incurred, alongside a classification of the expenditures into such categories as cost of coal carriage, repairs to houses, repairs to wagons, and oncosts of the raised coal with respect to pits and levels, fire engines, and incidentals.

At times there is evidence that Carron's management moved forcefully to institute control mechanisms over expenditures. General Court resolution No.799 (1778) mandated the use of pay tickets, a control device to track labour costs for all work done at Carron's manufactories and collieries (General Court, GD 58/2/2/1, p. 165). There were several references in the accounts to deductions from wages for the production of defective output or the failure to account adequately for raw materials disbursed (GD 58/14/2).

Responsibility and Departmental Cost Management

Carron Company pursued a policy of attributing responsibility for cost management to individual managers and departments at a very early stage in its history. In 1765, separate accounts were established for the blacksmith's operation and the plating forge in order to evaluate anchor and anvil production more accurately (General Court, GD 58/2/1/1, p. 171). Reference to this area of the business occurred again in October, 1778 when resolution No. 798 of the General Court requested Gascoigne and a manager named Ambrose Tibbats to investigate and report back on the operations of the plating forge since it had been exhibiting unsatisfactory levels of profit (General Court, GD 58/2/2/1, p. 165). In a letter dated 8 May, 1766, Garbett urged Cadell to place the different branches of the business completely on the shoulders of their superintendents for better or worse, 'glory or ignominy' being the function of branch performance (Cadell, ACC 5381, Box 28, Folder 1). Resolution No. 509 (1771) of the General Court went even further, mandating position and performance statements for each department head (General Court, GD 58/6/4/2).

That such intentions were acted upon is suggested by an exchange of letters between Cadell and Garbett noting production shortfalls in the period 1766–1767 and holding the relevant manager, one Mr. Mathews, responsible for 'shocking management' (Cadell, ACC 5381, Box 28, Folder 1). In 1769, a representation to the General Court urged the appointment of a powerful general manager at Carron so as to examine more forcefully the causes and effects of unprofitable branches of the firm's operation (GD 58/4/1/1, p. 11). Again, in 1771, there was reference to an examination of every individual branch of trade that had apparently been undertaken, although no results were disclosed (General Court, GD 58/2/1/1, pp. 396–397).

Even in the earliest years responsibilities were clearly delineated at Carron. Cadell took charge of mineral and raw materials supply; Tibbats controlled the air furnaces; and Thomas Roebuck, brother of John, supervised manufacturing generally. Roebuck tabulated the performance of different branches, especially the furnaces, and then replanned output (Campbell, 1961, p. 64). Each department head had to demonstrate profitability in order for operations to continue. Periodic evaluations, of this type resulted in the discontinuation of the nail trade and its sale to the Cadell family (Campbell, 1961, pp. 64, 82).

Overhead Allocation

The resolutions of the General Court over the 1763–1774 period included a number of clear directives with regard to the treatment of overhead costs. A 1763 pronouncement required that the costs of all goods produced at Carron should include applied overhead (General Court, GD 58/2/1/1, pp. 63, 73–78). In 1771, the minutes contained data on apparent losses showing in the accounts of the air furnaces and plating forge departments caused by an excessive allocation of general overhead costs. Accordingly, £1,485.10.10 from the air furnaces and £5,000 from the plating forge were recharged to the blast furnace account (General Court, GD 58/2/1/1, p. 398). This extensive reapportionment is disconcerting because it may have represented a cosmetic effort on the part of management to mask operating losses or it may have reflected significant misestimation of the allocation base. However, the point must be underscored that *ex post* calculations were being made during a period when the bulk of decisions based on accounting numbers were *ex ante*.

Direct evidence of the distribution of overhead costs based on a predetermined formula is forthcoming from an allocation process utilised in 1763. Overhead (called 'general charges'), estimated at two thousand pounds, was allocated to departments in the following proportions: blast furnaces 18/32; air furnaces 3/32; forge 4/32; plating and balling forge 2/32; slit mill 3/32; filling goods, grinding mill, and finishing goods 1/32; and nailery 1/32 (General Court, GD 58/2/1/1, p. 63). The basis of this apportionment was not disclosed in the minutes. However, it is clear from numbers Cadell generated for the budgeting of revenues and expenses for the various departments the year before that the allocation was not linked to revenues, expenses or profits.

Six years later the General Court decided to restrict the variety of expenses charged to the overhead account by specifying that there would be no further inclusion in 'General Charges' of rents, water expenses, construction charges, interest on capital, repairs, and salaries. Unfortunately, the records are silent as to which expenses continued to be allocated or why the decision was made to charge specific departments actual costs when items such as rent, water, and repairs are so appropriately handled as common costs (Monthly, GD 58/2/3/1, p. 16).

It is therefore clear that a basic system of overhead cost allocation to departments was in place very early in Carron's history. Not only was it considered in departmental performance evaluations, but on some occasions the impact of excessive allocations on department profitability was apparently recognised.

Cost Comparisons and Transfers

Examination of Carron's ironstone works reports in the years 1770–1772 revealed a detailed system of cost estimates and intracompany charges. The firm's accountant, William Lowes, provided detailed monthly reports that attempted to coordinate output from the fields with furnace consumption. The left-hand side (top) contained Lowes' report, calculations and suggested charge to the furnaces for ironstone supplied. The right-hand side (bottom) showed a partner's approval and any instructions:

Expenses of raising, leading, weighing on cost of 3232 ton last six months at Banton	£928.6.3½
Nearly per ton	5.9
Royalty, Inspection +Surface damages	1.6
Carriage to Carron	4.7½
	11.10½

It hence appears that this stone should not be charged less than 12/– to the Furnaces

This calculation is very proper and satisfactory and it is wished that Mr. Lowes would continue to make investigations of the other veins of stones in the same manner.

We also wish that Mr. Lowes will give us information from time to time of any new fields of Iron Stone that may occur to him, in the course of his enquirys.

Lowes also calculated ironstone reserves in the various fields, providing estimates of how long each would last at current levels of consumption. It was his recommendation that minimally a six month's supply be maintained in inventory as a contingency measure (GD 58/6/4/1).

A most impressive comparison of costs at various ironstone fields was prepared by John Beaumont, an unidentified analyst, in September, 1770. Bottom line costs at sundry venues were comprised of field-specific costings for raising the ironstone, royalties, inspection, repairs, transport and weighing. There was also commentary on the quantity of reserves in each location, the quality potential of the different types of ironstone, and the reasons for substantial price differentials at the various quarries (Cadell, ACC 5381, Box 28, Folder 2).

The Ironstone Works Reports (GD 58/2/4/1) also included detailed cost comparisons of producing a ton of metal utilising differing types of ironstone. Figure 1 is a representation of one such report. Columns 1–3 provide yield data on the weight of ironstone required to produce a ton of iron; column 4 establishes the transfer price to the furnaces; and column 5 the cost of a ton of metal utilising the various types of ore. Though this particular example does not identify specific problems, the Rosyth field was subsequently abandoned as a result of similar comparisons. When expenses at the Banton works became higher than at other fields, an investigatory visit was undertaken by Gascoigne and William Cadell, Jr.

In the 1790s, William Benson, the blast furnace supervisor, was transmitting monthly cost comparisons of his operation to the partners. These reports were calculations of cost per ton of good iron at each blast furnace. They were accompanied by notes explaining why production might be down either generally or at a particular blast furnace. Causes cited included bad weather, water level, manpower shortages, equipment breakdowns, downtime for repairs and differential productive potentials of individual furnaces (GD 58/6/4/4).

These examples of cost comparisons and cost transfers were consistent with the already observed Carron practice of departmental cost management. As early as 1769, some implications were spelled out in a report to the partners entitled 'A Short View of the Affairs of Carron Company'. The author, identified only as Mr. Wilson, called for the following practice and objective:

> . . . keeping the Co. Transactions in their Books, under such Form, as (upon a comparison with other Works) may be most readily and accurately seen, not only what each of the various Branches turn out, but also in what Parts of these Branches, we are on a footing with our Rivals.
>
> On this Comparison the Gentlemen will be enabled to See the End of each Object in pursuit, discover *where* our Advantage lyes in our Profitable Articles, and our Loss in the Unfavourable ones; and in the last discern whether such Loss can be removed or not . . . (GD 58/4/1/1, p. 25)

Costs for Decision-Making

Costs were frequently compiled for a wide range of management actions at Carron, most notably for product line decisions. The company withdrew from the anchor trade in 1769 because sales did not cover the £4 paid weekly to anchor workers even though this production afforded the company the opportunity to use its poorer quality iron (Monthly, GD 58/2/3/1, p. 7). In the same year Mr. Mathews calculated that every ton of charcoal iron made at the forge cost 16/10 and was inferior to Russian iron that could be purchased for 14/10 per ton (Monthly, GD 58/2/3/1, p. 15). Accordingly, he advised that Carron discontinue charcoal forging. In his 1769 missive to the partners, Mr. Wilson recommended that air furnaces be discontinued in favour of blast furnaces, arguing that:

> I am humbly of opinion that every Article cast at them, which possibly can be cast from the Blast however they may swell up the Profit of the Air Furnaces, are to the Company a Loss, of the difference between what they could be cast for at the Blast Furnaces and are cast for at the Air Furnaces—waste of metal and Reputation of the Quality of the Good included (GD 58/4/1/1, p. 54).

As we have seen, the nail trade was aborted on the basis of an unfavourable cost evaluation. In 1770, the partners passed a resolution to undertake cost analyses of the plating forge and blacksmith branches to determine whether they should be abandoned (General Court, GD 58/2/1/1, p. 270). The next year each division of the company was scrutinised similarly (General Court, GD 58/2/1/1, pp. 396–397). Unfortunately, the minutes do not reveal the results of these investigations.

A variety of decisions appears to have been made on the basis of cost information. The 1763 minute book reported John Roebuck's estimates of what impact the use of particular varieties of coal would have on production (General Court, GD 58/2/1/1, pp. 44–45). The firm in 1769 subcontracted the road repair function at Carron on the basis of cost estimates (Monthly, GD 58/2/3/1, p. 23). In the early 1770s, Lowes compared two managers of ironstone quarrying based on their respective output costs (GD 58/6/4/1). (Bailey's operation cost 11s.7d. per ton, while Roper's was more efficient at 8s.6d.) In 1786, a decision was made to repair a blacking kiln based on a cost-benefit analysis (Monthly, GD 58/2/3/3, pp. 37–38). In 1789, the partners were presented with a proposal to blow out and repair No. 2 blast furnace, based on a report prepared by the general manager (Monthly, GD 58/2/3/3, pp. 185–186).

Late eighteenth century cost decisions were frequently made on the procurement and repair of steam engines. In 1767, the partners exchanged correspondence on the need to purchase a steam engine although Garbett was hesitant (Cadell, ACC 5381, Box 28, Folder 1). In 1769, analysis revealed an engine's efficiency could be improved for a cost of £60 (Monthly, GD 58/2/3/1, p. 15). This expenditure was approved by the partners. In 1770, a sophisticated costing of the Kinnaird coal field engine included estimated downtime (Cadell, ACC 5381, Box 29, Folder 1).

A detailed technological and cost analysis of the potential for improving the extraction and profitability of Kinnaird coal was prepared in 1768. Based on an experiment conducted in the presence of Cadell, time and motion measurements were made on the volume of coal extraction necessary to fill one wagon. Based on the experiment, costs for workmen and other labour inputs were estimated. Wagonloads of output were forecasted from the use of 6 bullocks, 6 days a week. The expenses of labour, bullock, engine, carriage, rent and oncosts were totalled and compared with anticipated revenues from targeted output. It was calculated that:

1. 2½ yards of coal 30 inches broad produced 1 wagon of Great-Coal.
2. Each pit comprised 3 sets of workmen.
3. Each workman was to turn out 30 yards per day.
4. At these output levels, the total cost of holers, overseers, drivers, pithorses, bottomer, barksman, candles, baskets, ropes, etc. was estimated to be £1.14.0 for 12 wagons.
5. On the basis of 6 bullocks hauling 12 wagons per day each for 6 days, total costs were calculated to be £154.8.0.
6. Subtracting total cost of £154.8.0 from target revenue of £229.15.0 showed a profit of £75.7.0.

The above analysis was declared to 'make Kinnaird a very agreeable object'. In order to achieve this profit target, a detailed series of input and cost standards were then laid down (Cadell, ACC 5381, Box 28, Folder 1).

Because the cost of coal production was so vital to Carron's profitability, the General Court put to John Beaumont thirteen queries which were answered in a 1770 report. The response contained estimates of the coal reserves in various fields, on lands belonging not only to the company but to neighbouring owners as well. Beaumont calculated an estimated cost per wagonload of raising a ton of coal in each field. There was also a cost analysis of a proposal to sink the engine pit three fathoms to make deeper coal seams available for raising. Most remarkable, however, was a detailed production level analysis comparing costs of current extraction to half the usual volume. Expenses considered in the comparison were quite all-encompassing, including royalties, road tolls, surface damage repair, wagon and wagon way repair. The calculation concluded that at current levels of production the coal mining function would enjoy a transfer price gain of £1051.10s. while the proposed halving of operations would result in a £303 loss (Cadell, ACC 5381, Box 28, Folder 2). Though the terms were not actually used, this type of analysis reflects an awareness of the differences between fixed and variable costs.

Carron frequently solicited cost estimates from John Smeaton, next to James Watt the most famous engineer of the Industrial Revolution. In 1769 alone, there were projections of expenses associated with a new wheel shaft for No. 3 blast furnace, a new boring mill, and the power requirements to raise water to the furnaces (Monthly, GD 58/2/3/1, p. 26).

Budgets, Forecasts and Standards

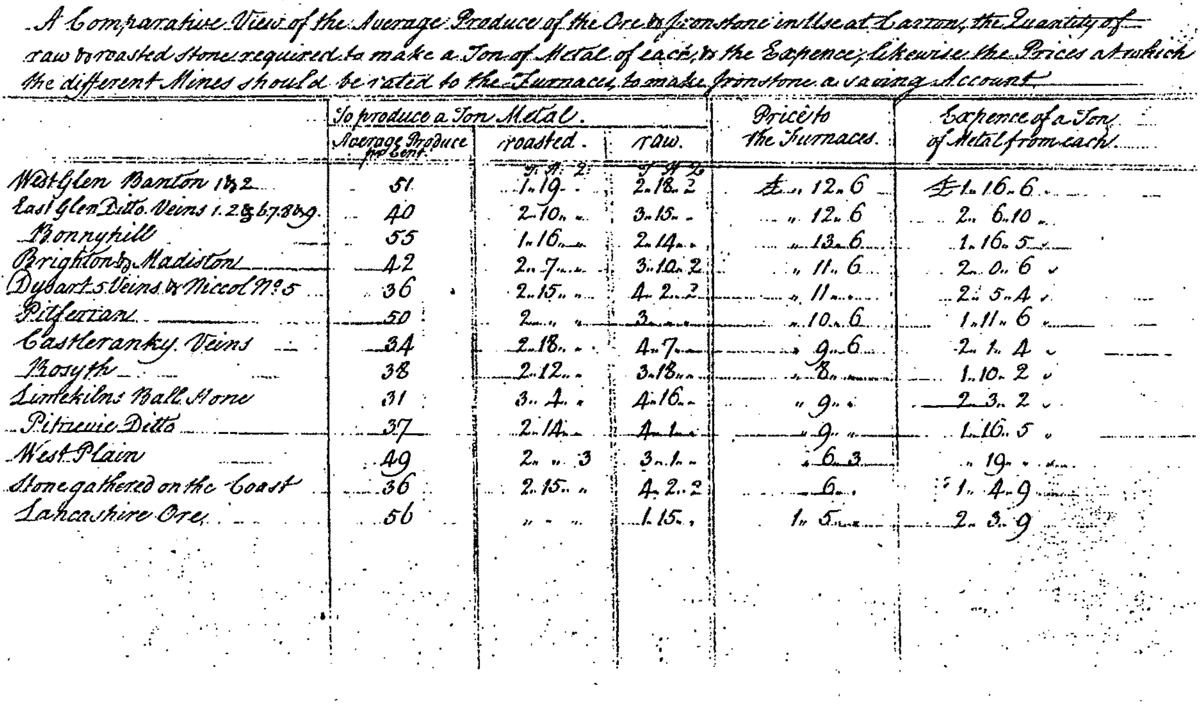
From its earliest days Carron utilised standard costs, as well as sporadic forecasting and budgeting attempts, in its management information system. The tabulations in Figure 1 became the basis for transfer prices and inventory standards. Similarly, Figure 2 is a report of weekly output, raw materials consumed, and wages paid at the five blast furnaces functioning in the 1790s. Once again, the various material inputs are shown at standard cost (GD 58/6/4/4). Price and quantity standards of inputs and outputs were an integral part of Carron management's decision processes. An additional example can be found in a letter of 26 October, 1766 when Cadell attributed a shortfall of ten tons and £30 per week in blast furnace output to badly repaired bellows (Cadell, ACC 5381, Box 28, Folder 1). Benson's letter of 22 March, 1793 requested the partners to approve an increase in the standard price of pit coal from 6s. to 7s. 1d. per ton, chargeable to the furnaces (GD 58/6/4/4). Seventy years after Carron commenced operations, its inventory records continued to display tonnage multiplied by standard prices to give a standard value (GD 58/8/56).

Evidence is also available of an occasional forecast or budget. A budget was prepared at Carron in 1762. Cadell, who was responsible for the effort, calculated expenses and revenues for each cost centre though once again there is no information about anticipated production levels or specific revenue/expense components (General Court, GD 58/2/1/1, p. 63). No subsequent attempt to compare budget estimates with actual results was documented in Carron's records, nor could any evidence be located to suggest that budgeting was an annual event. A General Court resolution of February, 1763 did request a thirteen-year projection of income at the Quarole Colliery (General Court, GD 58/2/1/1, p. 43).

Inventory Control

Right from the outset Carron management paid particular attention to inventory control. In 1763, the General Court legislated monthly examination of each nailer's stock of iron (General Court, GD 58/2/1/1, p. 54) and a reduction of coal purchases in order to lessen inventory levels (General Court, GD 58/2/1/1, pp. 33–34). Records in 1764 included a directive to weed out obsolete inventory

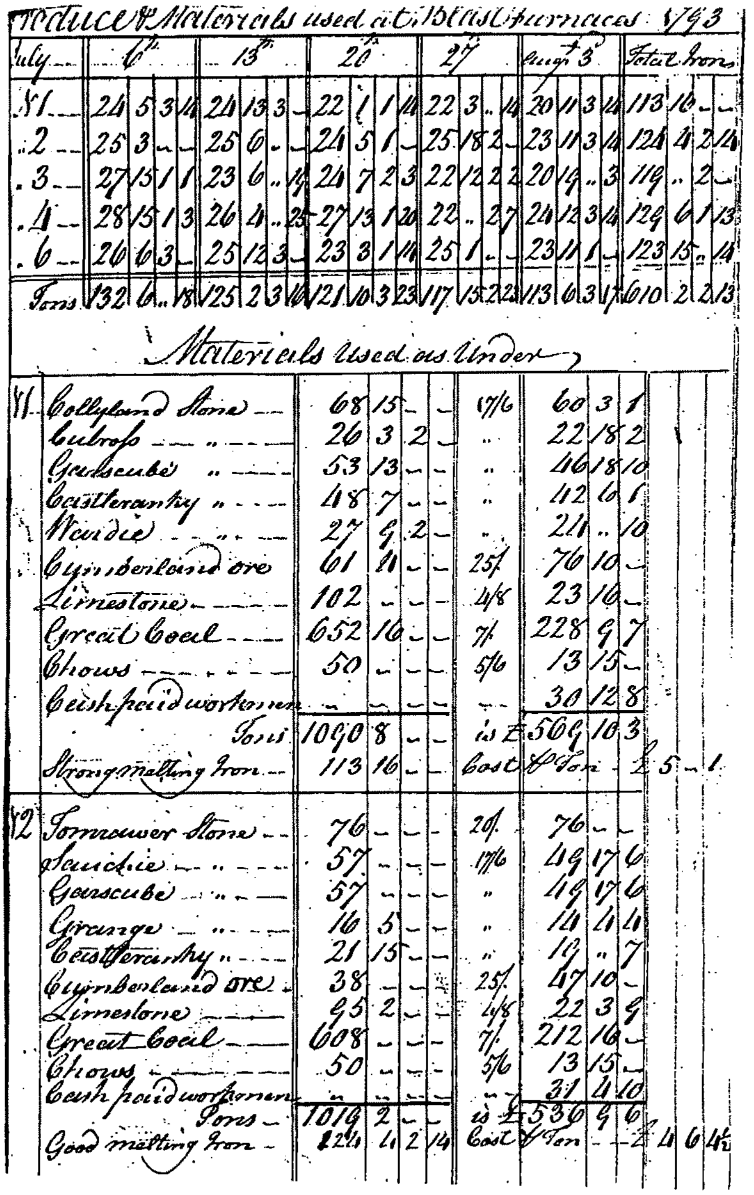
Figure 1
Ironstone Quantity and Cost Standards
Carron Ironstone Works Report, 1770–1772



A Comparative View of the Average Produce of the Ore or Ironstone in Use at Carron, the Quantity of raw & roasted Stone required to make a Ton of Metal of each, & the Expence; likewise the Prices at which the different Mines should be rated to the Furnaces to make Ironstone a saving Account

	To produce a Ton Metal.			Price to the Furnaces.	Expence of a Ton of Metal from each
	Average Produce per Cent.	roasted.	raw.		
		T. C. Q.	T. C. Q.		
West Glen Banton 1 & 2	51	1. 19. .	2. 18. 2	£ „ 12. 6	£1. 16. 6
East Glen Ditto. Veins 1. 2 & 6. 7. 8 & 9.	40	2. 10. „	3. 15. „	„ 12. 6	2. 6. 10
Bonnyhill	55	1. 16. „	2. 14. „	„ 13. 6	1. 16. 5
Brighton & Madiston	42	2. 7. „	3. 10. 2	„ 11. 6	2. 0. 6
Dysart 5 Veins & Niccol No. 5	36	2. 15. „	4. 2. 2	„ 11. „	2. 5. 4
Pitferran	50	2. „ „	3. „ „	„ 10. 6	1. 11. 6
Castlerankey Veins	34	2. 18. „	4. 7. „	„ 9. 6	2. 1. 4
Rosyth	38	2. 12. „	3. 18. „	„ 8. „	1. 10. 2
Limekilns Ball Stone	31	3. 4. „	4. 16. „	„ 9. „	2. 3. 2
Pitreavie Ditto	37	2. 14. „	4. 1. „	„ 9. „	1. 16. 5
West Plain	49	2. „ 3	3. 1. „	„ 6. 3	„ 19. „
Stone gathered on the Coast	36	2. 15. „	4. 2. 2	„ 6. „	1. 4. 9
Lancashire Ore	56	„ „ „	1. 15. „	1. 5. „	2. 3. 9

Figure 2
Monthly Blast Furnace Production Report
Carron Company, 1793



Produce & Materials used at Blast Furnaces 1793

July	6th				13th				20th				27th				Augt 3				Total Irons			
No 1	24	5	3	14	24	13	3	–	22	1	1	14	22	3	..	14	20	11	3	14	113	16	–	–
2	25	3	–	–	25	6	–	–	24	5	1	–	25	18	2	–	23	11	3	14	124	4	2	14
3	27	15	1	1	23	6	..	19	24	7	2	3	22	12	2	2	20	19	..	3	119	..	2	–
4	28	15	1	3	26	4	..	25	27	13	1	20	22	..	2	7	24	12	3	14	129	6	1	13
6	26	6	3	–	25	12	3	–	23	3	1	14	25	1	..	–	23	11	1	–	123	15	..	14
Tons	132	6	..	18	125	2	3	14	121	10	3	23	117	15	2	23	113	6	3	17	610	2	2	13

Materials used as Under

No 1	Collyland Stone	68	15	–	–	17/6	60	3	1	
	Culroſs	26	3	2	–	..	22	18	2	
	Garscube	53	13	–	–	..	46	18	10	
	Castlecarry	48	7	–	–	..	42	6	1	
	Wardie	27	9	2	–	..	24	..	10	
	Cumberland ore	61	11	–	–	25/	76	10	–	
	Limestone	102	–	–	–	4/8	23	16	–	
	Great Coal	652	16	–	–	7/	228	9	7	
	Chows	50	–	–	–	5/6	13	15	–	
	Cash paid workmen	–	–	–	–	–	30	12	8	
	Tons	1090	8	–	–	is £	569	10	3	
	Strong melting Iron	113	16	–	–	Cost per Ton				£ 5 – 1
No 2	Tormower Stone	76	–	–	–	20/	76	–	–	
	Sauchie	57	–	–	–	17/6	49	17	6	
	Garscube	57	–	–	–	"	49	17	6	
	Grange	16	5	–	–	"	14	4	4	
	Castlecarry	21	15	–	–	"	19	..	7	
	Cumberland ore	38	–	–	–	25/	47	10	–	
	Limestone	95	2	–	–	4/8	22	3	9	
	Great Coal	608	–	–	–	7/	212	16	–	
	Chows	50	–	–	–	5/6	13	15	–	
	Cash paid workmen	–	–	–	–	–	31	4	10	
	Tons	1019	2	–	–	is £	536	9	6	
	Good melting Iron	124	4	2	14	Cost per Ton				£ 4 6 4½

(General Court, GD 58/2/1/1, pp. 145–146). Pursuant to a 1771 resolution of the General Court to have job descriptions for department heads, Gascoigne listed instructions for warehousekeeper Ambrose Tibbats: (1) source documents must be kept for all raw materials disbursed to various departments; (2) stockouts should be avoided; (3) stock likely to become obsolete should be eliminated; and (4) finished goods of poor quality should not be accepted from other departments, while goods of lesser quality were to be labelled 'half-ware' (General Court, GD 58/6/4/2). Wilson's 1769 analysis of Carron Company called for the proper flow of costs through inventories, with all expenses in the manufacturing part of the business being included before the computation of cost of goods manufactured (GD 58/4/1/1, pp. 38–39). Before that time the expenses of limestone, ironstone, and pit coal depletion had not been transferred to inventory. Campbell (1961, p. 110) noted the continuity of management's concern over inventory levels, with ongoing efforts to reduce average inventory in warehouses and to stop the accumulation of large quantities of dead stock. Carron actively pursued a policy of careful inventory management and record-keeping to facilitate control, undoubtedly prompted by the capital constraints and financial difficulties of its early years.

Reflections on Carron costing

Recent significant essays on eighteenth century cost accounting origins have emphasised the importance of achieving an integration of costing with the financial records as described by Hamilton in 1777 (Edwards, 1989, p. 314; Mepham, 1988a, p. 68). Edwards (1989, p. 314) cited Cyfarthfa, the Welsh iron enterprise, as the only firm reported in the literature to date that achieved this degree of sophistication in the eighteenth century, and then not until 1791. As Campbell (1961, pp. 136–7) observed, Carron's pre-1786 financial statements were a shambles despite the excellence of the firm's departmental cost collection. Early inventory books, though beautifully maintained, were inconsistent with regard to the items included. Though depreciation was taken in the records as early as 1769, there were major asset write-downs in 1769, 1784, and 1812, indicating that the system was functioning on an *ad hoc* basis. It was not until 25 April, 1854 that the General Court resolved to hire a professional accountant (James Brown, Esq. of Edinburgh) to determine if the financial accounting books had been properly kept in the past and to achieve a needed simplification of the system (General Court, GD/58/8/69). However, in some instances Carron did attempt an integration which failed because of the financial reporting shortcomings. The transfer prices developed for the extractive operations did appear in the blast furnace accounts and those recorded for the furnaces in the 1790s were transferred at standard to inventory. Carron's utilisation of standard costing and departmental allocation of overhead were other cost management techniques which had an impact on the financial record-keeping. Notwithstanding, there is insufficient evidence to claim that anything approaching a mature integration was achieved. The authors were somewhat hampered in attempts to evaluate this important relationship because the Carron records do not contain as many examples of detailed product costings as appear in the archives of other Industrial Revolution firms. There are references to these costings having been requested by the General Court. There was compliance in all likelihood; the calculations have just not survived.

Cost management processes in Carron appear to have been motivated by the firm's early problems with securing adequate partnership capital, attaining profitability, and maintaining liquidity. The vital concern with cost management was evident in the many examples of cost analyses and estimates designed to evaluate the profitability of product and business segments. The directions and form that Carron cost records and management took reflected key aspects of Carron Company's environment in the second half of the eighteenth century. While the maintenance of profitability would have been an important concern to Carron's management, the attention to expenditure and inventory control was also very much a product of the firm's paucity of capital investment and lack of financing resources. Its system of responsibility accounting and departmental cost management appears at least partly to have been a function of the original partnership combination of inventor (Roebuck) and businessmen new to this particular industry (Garbett and Cadell). Others followed in their footsteps.

Carron quickly became a large-scale, vertically integrated operation involving ironstone fields, collieries, mills, and blast furnaces, ultimately experimenting in and producing a range of specialised products. This complexity, along with a concern to maintain profitable operations in all segments, apparently stimulated the practices of overhead allocation and the interdepartmental charging of coal and ironstone costs from mineral fields to furnaces. The skilled labour shortages identified by economic historians for that period also afflicted Carron, as did labour inefficiencies. These problems were reflected in the cost records by explanations of shortfalls in output quantity and at times, quality. References to the need for product quality control in the records testify to Carron's position as a specialist producer needing to maintain markets through product differentiation and quality. From the very beginning then, cost management and control was for Carron Company an exercise of paramount importance.

In the Carron Company records we have found ample evidence of cost management activity during the early British Industrial Revolution. Costing was employed extensively in management decision-making, ranging from the development of production standards to departmental and product line evaluations. Even more impressive than the variety of uses the Carron owners and managers found for cost data was the detail of certain cost analyses. The 1768 cost estimation for the Kinnaird Colliery provides just such an example.

Accounting historians in evaluating the managerial accounting of the British Industrial Revolution must not be misled by the absence of an accounting literature, an accounting tradition, and an accounting profession. The entrepreneurs of the period, such as the founders of Carron, possessed the economic talent and the foresight to utilise cost management to their competitive advantage.

References

Briggs, A., *The Age of Improvement: 1783–1867* (London: Longman Group, 1959).

Brown, R., *A History of Accounting and Accountants* (Edinburgh: T. C. & E. C. Jack, 1905).

Campbell, R. H., 'The Financing of Carron Company,' *Business History*, Vol. 1, (December 1958), pp. 21–34.

Campbell, R. H., *Carron Company* (Edinburgh: Oliver & Boyd, 1961).

Campbell, R. H., *The Rise and Fall of Scottish Industry 1707–1939* (Edinburgh: John Donald, 1980).

Chandler, A. D., 'The Emergence of Managerial Capitalism,' *Business History Review*, Vol. 58 (1984), pp. 474–503.

Chatfield, M., *A History of Accounting Thought* (Huntington, New York: Robert E. Krieger, 1977).

Edwards, J. R., 'Industrial Cost Accounting Developments in Britain to 1830: A Review Article,' *Accounting and Business Research*, Vol. 19, No. 76 (Autumn 1989), pp. 305–317.

Edwards, R. S., 'Some Notes on the Early Literature and Development of Cost Accounting in Great Britain,' *Accountant*, Vol. 97, (August–September 1937), pp. 193–195, 225–231, 253–255, 283–287.

Elbaum, E. and Lazonick, W. H., 'The Decline of the British Economy: An Institutional Perspective,' *Journal of Economic History*, Vol. XLIV, No. 2 (June 1984), pp. 567–583.

Garcke, E. and Fells, J. M., *Factory Accounts, Their Principles and Practice* (London: Crosby, Lockwood & Son, 1893).

Garner, S. P., *Evolution of Cost Accounting to 1925* (University, Alabama: University of Alabama Press, 1954).

Hamilton, H., 'The Founding of Carron Ironworks,' *Scottish Historical Review*, Vol. 25 (1928), pp. 185–193.

Johnson, H. T., 'Early Cost Accounting for Internal Management Control: Lyman Mills in the 1850's,' *Business History Review*, Vol. XLVI, No. 4 (Winter 1972), pp. 466–474.

Johnson, H. T. and Kaplan, R. S., *Relevance Lost: The Rise and Fall of Management Accounting* (Boston: Harvard Business School Press, 1987).

Jones, H., *Accounting, Costing and Cost Estimation, Welsh Industry: 1700–1830* (Cardiff: University of Wales Press, 1985).

Littleton, A. C., *Accounting Evolution to 1900* (New York: American Institute Publishing Co., 1933).

Mackie, J. D., *A History of Scotland* (Harmondsworth: Penguin Books, 1964).

Marshall, G., *Presbyteries and Profits* (Oxford: Clarendon Press, 1980).

McKendrick, N., 'Josiah Wedgwood and Cost Accounting in the Industrial Revolution,' *Economic History Review*, Vol. 23, Second Series (1970), pp. 45–67.

Mepham, M. J., *Accounting in Eighteenth Century Scotland* (New York: Garland Publishing, 1988).

Mepham, M. J., 'The Eighteenth-Century Origins of Cost Accounting,' *Abacus* Vol. 24, No. 1. (1988a), pp. 55–74.

Parker, R. H., *Management Accounting: An Historical Perspective* (New York: Augustus Kelley, 1969).

Parker, R. H., *The Development of the Accountancy Profession in Britain to the Early Twentieth Century* (Academy of Accounting Historians, 1986).

Pollard, S., *The Genesis of Modern Management*, (Cambridge: Harvard University Press, 1965).

Roll, E. L., *An Early Experiment in Industrial Organization* (New York: Augustus Kelley, 1968), reprint of 1930 edition.

Solomons, D., *Studies in Costing* (London: Sweet & Maxwell Ltd., 1952).

Stacey, N. A. H., *English Accounting 1800–1954* (London: Gee & Co. Ltd., 1954).

Stone, W. E., 'An Early English Cotton Mill Cost Accounting System: Charlton Mills, 1810–1889,' *Accounting and Business Research* (Winter 1973), pp. 71–78.

Urwick, L. and Brech, E. F., *The Making of Scientific Management* (London: Sir Isaac Pitman & Sons, 1964).

Wells, M. C., *Accounting for Common Costs* (Urbana: Center for International Education and Research in Accounting, 1978).

Wells, M. C., 'Some Influences on the Development of Cost Accounting,' *Accounting Historians Journal*, (Fall 1977), pp. 47–61.

Yamey, B. S., 'Scientific Bookkeeping and the Rise of Capitalism,' *Economic History Review*, Vol. I, No. 2 & 3, 2nd Series, (1949), pp. 99–117.

Yamey, B. S., 'The Development of Company Accounting Conventions,' *Three Bank Review*, 47, (1960), pp. 22–37.

Financial Accountability & Management

Winter 1989 Editor: John Perrin Vol. 5 No. 4

Contents

Performance Auditing in the Central Government of Japan
by Kiyoshi Yamamoto and Masayuki Watanabe

Capital and Operating Budgeting Practices in Pure Nonprofit Organizations
by John. T. Zietlow

Fund Accounting in Nonprofit Hospitals: A Lobbying Perspective
by Dana Forgione and Gary Giroux

Social Income and Public Sector Corporations: A Case Study of the Ghana Food Distribution Corporation
by K. K. Sarpong and S. J. Gray

Public Enterprise: The Nexus Between Organization and Control
by Ron Hirshhorn

Subscriptions

	UK only	Europe	Rest of the World	North America
		1990 volume		
Institutions, libraries and professional	£39.00	£46.00	£49.00	$81.50
Teachers or students	£17.00	£19.50	£21.00	$35.00
		Single Issue		
Institutions, libraries and professional	£10.25	£12.00	£12.75	$21.50
Teachers or students	£4.75	£5.50	£5.75	$9.75
Journal of Business Finance & Accounting and Financial Accountability & Management (combined rate)				
Institutions, libraries and professional	£83.50	£99.00	£100.00	$166.00
Teachers or students	£38.50	£44.00	£46.50	$77.00

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford, OX4 1JF, UK. Editorial communications to *Financial Accountability & Management*, Department of Economics, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, England.

Accounting and Business Research, Vol. 20, No. 79, pp. 223–230, 1990

The Share Investment Decision Process and Information Use: An Exploratory Case Study

G. Gniewosz*

Abstract—This paper describes the use of accounting and other information in the share investment decision process of an institutional investor. The study was conducted within the context of an organisation's everyday working environment. The focus was on qualitative data and analysis of a case study rather than on quantitative data and general tendency analysis of a random sample. It is concluded that the significance of the annual report as an information source changes over the period of one year. It varies from serving as a primary information source to serving in a confirmatory role. Furthermore, the annual report also acts as a stimulus for identifying specific questions rather than merely as a source of information in response to prior questions.

Rationale and focus of this study

This paper reports the results of an exploratory case study, investigating the use of accounting information and information from other sources, in the share investment decision process of an institutional investor. The purpose of the study was to investigate information uses, including interaction, in the share investment decision process within the context of 'real life' complexities. The aim was to obtain qualitative data from a case study rather than to focus on quantitative data of a random sample. 'Real life' complexities means investigating the investment decision process in the everyday working environment rather than in an environment structured for the purpose of the study. This paper provides a descriptive account of a real-life situation.[1]

The focus is on an organisation as an investor and in particular on individuals within an organisation. This does not, however, mean a focus on cognitive processes of individuals in isolation from their environment, a research focus often taken in Human Information Processing studies.[2] Neither does this mean a strictly organisational decision making focus.[3] Furthermore the research orientation of this study falls between efficient market research on the one hand, and survey research on the other.

Efficient market research indicates that annual financial reports contain only modest information content for investors.[4] This implies that the market obtains a large proportion of the information contained in annual reports from other sources prior to the release of these reports. Efficient market studies are aggregate studies; they are only concerned with aggregate market reaction. Furthermore, these studies are 'black box' studies. They are input-output studies and are not concerned with the content of the 'black box' (or process) between input and output.

Several survey studies have addressed the question of the importance of different information sources.[5] These studies were, among other things, concerned with priority ranking of different information sources, based on participants' perceptions. Although the findings from these studies are somewhat inconclusive, annual financial reports are generally found to rank very high in the stated order of information priority.

This paper attempts to build a bridge between survey research and efficient market research by reporting the findings of a detailed in-depth study at the individual investor level. It explains what is happening at the individual investor level, thus reconciling the findings of what investors report in survey studies with the findings of aggregate market studies.[6]

---

*The author is senior lecturer in accounting at the University of Wollongong. He acknowledges the useful comments of an anonymous referee on an earlier draft.

[1] See for example Lincoln and Guba (1985) for an extensive treatment of 'naturalistic inquiry'.

[2] See Libby (1981) for a summary of HIP research in accounting.

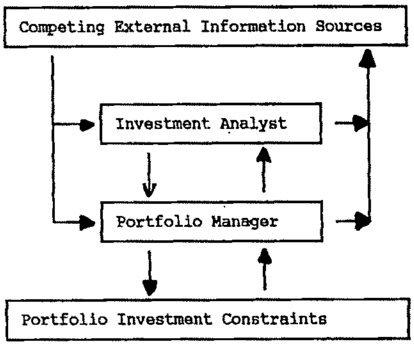
[3] Refer to Cyert and March (1963) for a discussion of this focus.

[4] See, for example, Ball and Brown (1968).

[5] See, for example, Anderson (1979, 1981), Arnold and Moizer (1984), Baker and Haslem (1973), Chenhall and Juchau (1977), Chang and Most (1980), Epstein (1975) and Lee and Tweedie (1981).

[6] This study addresses to some extent some of the problems outlined by Hines (1982).

Figure 1
Information flow and feedback


Competing External Information Sources
Investment Analyst
Portfolio Manager
Portfolio Investment Constraints

Two phases of the equity investment decision process are identified in the literature:[7] investment analysis and portfolio decision. Investment analysis is presumed to precede the portfolio decision and to provide a basis for that decision. With regard to information flow in this process, an institutional investor's two-phase process can thus be illustrated as in Figure 1.

Arrows in Figure 1 represent the communication/feedback of data/information in the interaction between analyst and portfolio manager. Competing external information sources provide an input to the investment analyst and the portfolio manager. The portfolio manager faces internal and external investment constraints, and at the same time these constraints are influenced by the individual's actions. The portfolio manager's actions thus become part of the external information sources available in the market. This study focuses largely on the competing external information sources faced by investment analysts.

Connolly (1977) places decision-related information sources for individuals within organisations into three categories:

(i) those received passively and without any specific effort on the recipients' part and as part of their regular reading and monitoring of professional and non-professional publications as a normal part of their organisational role;
(ii) those actively sought in response to a specific decision, for example an investigation aimed at discovering some specific fact;
(iii) those retrieved from a memory bank, being information previously acquired and stored.

Connolly subsequently hypothesises that:

(i) information acquired by active search will be more decision specific than information acquired passively;
(ii) the ease of acquiring information, or of converting it into usable form, will affect the extent to which it is used.

The implications of these hypotheses are that annual financial reports, which are routinely received, are less decision specific than information actively sought. Secondly, since annual financial reports are routinely received (i.e. they are easily obtained) they are extensively used.

In summary, the focus of this paper follows the following specific orientations:[8]

1. the interaction between information from different sources over a full investment period;
2. the extent to which annual report information is share investment decision specific.

Approach to inquiry

Since the purpose of the study was to capture a process in action, the research approach of an in-depth exploratory case study rather than a central-tendency study of a random sample was considered essential.[9] Furthermore the focus was on qualitative data and knowing rather than on quantification and subsequent statistical analysis of certain activities, i.e. quantitative knowing.[10]

One of the main methods of data collection was direct observation of the activities within the organisation.[11] Data was collected by observing individuals in their daily activities within their natural environment. Direct observation was supplemented by other data collection methods when considered necessary; for example, individuals were questioned whenever it was considered necessary for the clarification of observed data. Analysis of documents such as working papers, written formal and informal reports, and documents presented at the various meetings, provided other sources of data.

The use of verbal protocol analysis, as outlined by Biggs (1978) and Bouwman (1981), proved to be inappropriate because of the rather flexible nature of the study. One method of data collection adopted was nevertheless the taping of the verbalisations of analyses of annual reports. In many cases, analysts had analysed the annual reports before these tapings took place, which means that analysts repeated the reasoning process of their analyses for the purpose of taping it. The tape recordings averaged about 1.5 hours in length, varying from 1 hour to 2.5 hours. Tapings were followed up by unstructured interviews, focusing on the content of the tapes.

---

[7] See, for example, Ahlers (1977) and Finn (1981).

[8] These orientations are used as focus of description in the paper rather than as hypotheses to be tested in the conventional sense.

[9] See, for example, Hagg and Hedlund (1979) and Mintzberg (1979) for a discussion of the suitability of the use of case studies. Furthermore, Campbell (1979) states that the dominant mode of study in some areas of social science 'remains the intensive study of a single foreign setting by an outsider . . .'. He also refers to this earlier stance on 'the One-shot Case Study' (Campbell & Stanley, 1966) as 'my earlier dogmatic disparagement of case studies'.

[10] For example, Campbell (1979) argues for the complementary nature of qualitative and quantitative knowledge.

[11] See, for example, Bouchard (1976), McCall and Simmons (1969), Peak (1966), Weick (1968) for a discussion of direct observation as a research method.

Data collected from various sources was closely examined. Generalisations of findings were continuously modified as the analysis progressed, i.e. the analysis was carried out while data collection was still in progress.[12] The reported findings have been closely examined as to their consistency over the period of research.

Any research using case studies is rather expensive in terms of time taken. The question as to what constitutes an appropriate time spent on a case study is problematic. Given the focus of this study, it was considered appropriate that the activities representative of a twelve month period had to be adequately captured.

The relationship between the researcher and the individuals within the organisation was at all times relaxed, and members did not give any indication that they would have behaved differently in the absence of the researcher. It must also be remembered that actual share investments were continuing during the research period and thus individuals had to perform in their normal way. No obtrusive measures, as outlined by Webb *et al.* (1966), are thus expected from the presence of the researcher.

The selection of the particular institutional investor was made for the following major reasons:[13]

(a) It is one of the leading Australian institutional share investors and thus plays a major role as a financial intermediary in Australia. Its investment policies and actions are an important factor in the overall domestic share market.
(b) The investor has a strong stated commitment to, and belief in, fundamental analysis. Because of the focus of this study such a commitment was required for the institution to be selected.
(c) The institution was willing to participate in the study. It was envisaged that the focus of the study would require free access to all relevant internal processes as well as information, which in parts could be of a rather confidential nature.

Sampling for this study was, therefore, 'purposeful' rather than random.[14]

To reduce the paper to a manageable size, the focus was reduced to the industrial share investment sector, thus excluding the mining sector. Another major reason for the exclusion of the mining sector was the different evaluation processes followed. Mining companies are evaluated more distinctly in terms of global supply, demand and price structure for products. This is not to say that these global factors are not important for industrial companies. It is, however, the distinct difference in the importance of these factors in the whole evaluation process which made these companies unsuitable for inclusion in this study.

Analysts are responsible for the information gathering, information analysis, interpretation of results, and investment recommendations of assigned companies. It is thus the analysts' responsibility to update constantly their views on the companies as new information comes to hand. An analyst, therefore, develops an in-depth specialist knowledge of certain industries, and companies within industries.

Interaction between information from different sources over a one-year investment period

It is one of the analysts' functions to originate investment/disinvestment recommendations for the shares under their control. In order to perform this function analysts attempt to maintain a current view on the shares at all times. This is achieved by keeping up-to-date on all relevant information, available at any one point in time, affecting the particular shares, whatever the source of the information. Analysis of company relevant information is thus a continuous process rather than merely an exercise to be carried out in isolation at the time of the release of the annual report. This process is continuous even if no buy/sell recommendations may result at a particular point in time but may merely result in a confirmation that no change from the current situation is considered desirable.

As already noted, information sources can broadly be categorised into routinely received information and information directly sought. Routinely received information includes the financial reports (interim and final) published by companies, brokers reports, financial press reports, stock exchange reports, and various others. Directly sought information originates from the steps taken by individual analysts, based on specific questions or problems. For example a company visit, a phone call to the company or other market participants, or asking specific questions at the annual general meeting would fall into this category.

---

[12] See, for example, Lincoln and Guba (1985) for a discussion of the adaptation of the Glaser and Straus (1967) constant comparative method.

[13] For confidentiality reasons the identity of the investor cannot be disclosed.

[14] See Patton (1980) for a discussion of the credibility of sampling strategies, including 'purposeful' sampling.

Information flow from various sources varies over the period of a year. Furthermore, the intensity of information flow from various sources varies during the year. For example, annual reports are issued once a year, interim reports twice a year, newspaper items appear whenever company activity warrants it, and brokers' reports on individual companies appear whenever brokers see fit. The tempo and the nature of analysts' activity thus changes throughout the year and is partly governed by the annual information flow from major sources, for example the clustering of annual report releases.

Analyses of information from these various sources, and the eventual recommendations, are also affected by the analyst's general experience and by experience with individual companies and industries in particular. The process of analysis is thus also affected by the extensiveness of the individual's 'long term memory' or 'memory bank'.[15]

Information from individual sources is not used in isolation, or in terms of some hierarchy of importance, but in a complementary way. For example analyst A made the following comment when forming an expectation of a particular share:

> ...and I don't get those anymore from the annual report. I just get them from my whole variety of information which I may have written down as I did following the telephone contact. My major step at the visit, which was done the week before last, was to get an update view on this.

Information from different sources varies in breadth, as well as depth. The complementary use of all these information sources provides analysts with a data base for buy/sell/hold recommendations in a dynamic market. Findings from efficient market research confirm this continuous process of analysis, interpretation, and recommendation, by indicating that information from annual reports is incremental rather than revolutionary in nature. The overall function of information from all sources is to provide as extensive an information base as possible from which to make informed share investment decision recommendations. Within this overall function, information from different sources performs at times somewhat different specific functions, as well as taking on different levels of significance over the year.

The annual financial report is one of the major information sources used in the continuous process of share investment decision making. In relationship to other individual information sources, a considerable amount of time is spent on the analysis and digestion of the information contained in the annual report. Over one year, the time spent on certain other, more repetitive information sources (for example, reading the financial press) does exceed the time spent on the analysis and digestion of annual report information. However, in terms of time spent on information received from one source at a single point in time, the annual report dominates all other sources. Of all the information sources used, the annual report is not only considered by analysts as most extensive and comprehensive but also as most important since it is the official 'snapshot', issued by the company itself. It is central to the whole information-use process in share investment decisions. The analysis of the annual report produces most extensive and detailed working papers, which are referred to later during the annual investment period whenever information is received from other sources.

Annual report analysis is a lengthy and often interrupted exercise extending over several days. For example, on one occasion an analyst spent a whole day merely identifying the contributions made by some individual segments. The exercise was continued on a subsequent day. In the words of analyst F, analysis is 'quite a time consuming process'. In another case an analyst took over two hours merely to break up certain production figures, as shown in the annual report, into the various desired parts. After two hours it was lunch break and the analyst did not return to the same report for several days. At the same time it must be pointed out that this analyst was already familiar with the particular annual report. In yet another case, an analyst spent about one hour merely to find an arithmetical mistake on the worksheet and subsequently did not continue with that particular analysis.

Furthermore, analysts do not necessarily perform detailed analyses as soon as annual reports are received. Depending on the urgency of other work at hand, detailed analyses may be postponed, especially if the reported results are in line with expectations. It must also be remembered that annual report receipts are clustered. Several annual reports may be received by an individual analyst on one particular day. Immediate attention to all reports may thus be physically impossible.

The annual report serves various functions within the investment period of one year, depending on the time in the year, as well as the nature and content of information from other sources.

---

[15] See Newell and Simon (1972) and Connolly (1977) for a discussion of these respective concepts.

One function of the annual report is to provide the base for the evaluation of the accuracy of prior forecasts. As analyst E pointed out:

> I reconcile my prior forecast with the annual report, particularly if there have been significant changes to the company, or if the results have been a bit unexpected or if for some reasons the brokers views are thought inaccurate.

Although all reported actual results are reconciled with the respective forecasts, the degree of reconciliation varies not only between individual analysts but also for individual analysts at different times. The extent of reconciliation is partly determined by the analyst's detailed knowledge of the particular company.

A detailed analysis of the difference between forecast and actual financial results is made in order to gain an understanding of the particular factors which gave rise to the difference. The knowledge gained from this exercise is stored for future use. It must also be remembered that the forecast being reconciled may have been periodically updated over the last year as part of the analyst's continuous process of keeping up-to-date.

The annual report is also used to provide a further set of figures in the company's financial history. The function of the annual report is thus to establish a trend (or time-series) of financial performance by management of their stewardship function.

With regard to forecasting future performance, the annual report is not used as a direct extrapolation tool. Analysts do not statistically extrapolate the time-series of past results. The annual report does however provide a large part of the information base for forecasts at a particular point in a year. For example, the disclosed non-current assets figure is used to forecast the depreciation expense for the following year, and the disclosed term liabilities to forecast the interest expense.

The annual report also serves as an information base for identifying the underlying factors which gave rise to the particular financial result. Analysis of the annual report provides an understanding of the composition of the results, for example the composition of net profit after tax. Annual report analysis thus provides an understanding of the 'real-world' reasons for the financial result. For example, analyst F justified the detailed analysis of the disclosed sales figure by one particular company as follows:

> This is quite a time consuming process...
> But I have to get the relative history right before I can make predictions based on what they have done in the past.

It is the understanding of the factors underlying the current financial results which is used as the starting point for the subsequent forecast of financial results.

Despite the use of the annual report as an information base for gaining an understanding of the composition of the results, analysts also rely extensively on their accumulated knowledge of the company in the explanation of the underlying factors for the particular financial results. The function of the annual report in this respect, therefore, partially depends on the analyst's 'long term memory'.

The annual report also serves the function of confirming information from prior or other sources. For example, the knowledge of a major change in fixed assets since the time of the previous annual report analysis or forecast may have been gained from other information sources. In this case, the annual report performs a confirmatory function rather than a primary information function. It serves as a check point of accuracy of information from other sources.

Another function of the annual report is that it acts as a stimulus in identifying questions, the answers to which have to be obtained from other sources, for example by asking the company directly. Thus, rather than take the annual report as an answer to an inquiry, analysis of the annual report is used as a stimulus for identifying additional questions to be investigated. For example the analyst may consider total revenue to be rather unexpected and, therefore, seek more detailed information as to its sources. Other examples are inquiries into the reasons for particular segment contributions, the terms and conditions of certain contractual arrangements, and certain physical aspects of the company's operations.

The functions of the interim report are somewhat similar to those of the annual report. In addition, the half-yearly report, as the official half-way mark, is used to check the accuracy of expectations at that point. The interim report is also used to revise the forecast for the remainder of the year and extend the forecast for a further six months.

The financial press is generally the first passively received information source, although at times the first passive source is represented by other sources such as stockbrokers' reports. This information provides the stimulus for a rather hurried analysis of its impact on the previous forecast, thus initiating the rechecking of expectations. This instant attention to press releases strongly contributes to the information market efficiency claimed and demonstrated in the literature.

Peer reports, for example from share brokers, basically serve a confirmatary role for the internal analysis and forecast. An agreement with peer reports provides a sense of confidence in the likely achievement of the internally forecasted results. A disagreement, on the other hand, generally results in an attempt to reconcile the difference by obtaining the underlying assumptions of the forecasts from individual members of the peer group.

Share investment information requirements are not entirely fulfilled from routinely received sources but supplemented by 'actively sought' information. One of these major sources is, in addition to stockbrokers, the company itself. This source is tapped in one of two ways. On the one hand information is sought during an open forum, for example by asking questions of the company during a meeting such as the annual general meeting, or during a company address to a special interest group such as a stockbrokers' luncheon. Alternatively, information which is often considered to have a competitive investment advantage (for example, where the significance of certain public information is considered not to be properly appreciated by the market), is sought during an individual contact with the company.[16]

Information gathering company visits can be categorised into three major types:

(i) Company visits which are part of the 'familiarisation with the company' stage. This type of visit is made at the time when the analyst is somewhat inexperienced with a particular company and/or industry. This does however not necessarily mean the analyst is inexperienced as an analyst or inexperienced in making company visits. It is generally believed that two to three company visits are required to get a reasonably detailed understanding of a company's operations, the thinking of management, and the environment in which the company operates.

(ii) Company visits which provide an update of previous visits. Periodic company visits are one way of retaining a detailed company and industry knowledge. Update visits are also made to understand the implications of changes in senior management, changes in company operations, or changes in the company's operating environment. Company visits of this nature have a broad, rather than a specific problem, focus.

(iii) Company visits and contacts which are made to gain an understanding of a specific problem. For example, from the analysis of the annual report the analyst identifies certain items of information which are not disclosed in the annual report and which are not available from other sources but are considered to be important, for example a significant change in operating profit margin percentage. Alternatively, this type of company visit is originated by various other information sources such as brokers' reports, or even a financial press release.

Company visits are scheduled whenever it is felt necessary. However, company visits in the first category, and to some extent the second, are generally scheduled for the time of year when relatively few annual reports are received. Visits and contacts in the third category are generally scheduled at short notice and are mainly of short duration.

The extent to which information in the annual report is share investment decision specific

At the micro level the investment process can be conceptualised as consisting of the following phases: (i) analysis of past performance, (ii) forecast of future performance, (iii) investment recommendation and (iv) actual investment. Although these four phases are stated as separate, it must be realised that they often do not occur in a strict sequential fashion. For example, information received from the morning newspaper is often used for the second phase without formalised attention to the first. On the other hand, analysts follow sequentially all four phases on receipt of the annual report.

Within this process, investment recommendations are based on professional judgment, focusing on four key aspects. Standardisation of recommendation criteria into these four aspects is seen as a necessity for effective communication within the organisational setting. Also, it is perceived that, through standardisation, consistency of investment recommendations is achieved and consistent investment decision making facilitated. Annual report information is used, explicitly or implicitly, in all four key areas to varying degrees. The four areas are:

(i) The Company's Growth Prospects

The attention is mainly on those factors which have the greatest bearing on the company's expected future performance, in particular in earnings, dividends, and share prices. The annual report does contain a large volume of the information used in the growth forecast, although direct time series extrapolation of financial results is not practised.

Forecasts of a company's growth prospects are based on future expectations about the economy as a whole, about the industry in general, and only thirdly about the company in particular. The annual report provides an information base at this third level. Specific information in the annual report is used to forecast individual components of the earnings computation. For example, the fixed assets base is used to calculate the expected depreciation charge.

---

[16] Analysts were however acutely aware of the need not to fall foul of insider-information/trading legislation.

(ii) Significant Financial Market Factors

The focus is on identification and evaluation of those factors which are perceived to influence the market's assessment of the company. For example, close attention is paid to possible takeover potential, including speculation.

Identification and evaluation of significant financial market factors requires the analyst's understanding of the workings and psychology of the market. Focusing on the function of the annual report in this context thus requires an understanding by the analyst of the use made of the annual report by other market participants. Analysts also strongly believe in a concept of 'mass psychology' of the market where good news in a bull market will be more favourably received than the same piece of information in a bear market. Expected market reaction to annual report information is thus partially modified for the current market situation.[17]

Analysts invariably compare their own forecast, after analysis of the annual report, with that of the average of all brokers, as well as the forecasts of some individual brokers. Any discrepancies are reconciled by an attempt to obtain information from individual brokers as to the assumptions underlying their forecasts. This attempt often involves rather lengthy and detailed discussions.

(iii) Investment Parameters

Particularly considered are the dividend and share price yield sought for the individual company, in conjunction with the acceptable risk. Risk/return evaluation is carried out periodically rather than each time an investment recommendation is made. This evaluation is reviewed periodically, generally at quarterly intervals.

Because of the relative size of the investor (associated with a strong cash inflow) and the size of the domestic share market, cash flow constraints for domestic share investments do not exist for this investor. This is particularly so because of corporate policy not to get into a position of control or significant influence over the investee. The problem is rather one of lack of acceptable domestic share investment opportunities. The absence of comparative analysis between different investee companies was therefore not surprising.

With respect to investment parameters, the information in the annual report is only indirectly recommendation specific. Return sought, and level of risk perceived for an individual company are to some extent determined by the company's performance history. An evaluation of company performance, as pointed out earlier, is largely carried out through an analysis of the annual report.

(iv) Investment Strategy

Investment strategy is considered in terms of short, medium, and long term focus. The investor, although being basically a long term investor, is very conscious of profits from short term trading activity, as well as profits from being caught up in takeover battles.

Short/medium/long term investment strategy recommendations are made on the basis of two aspects: (i) share price behaviour expectations, and (ii) timing of company performance expectations. As to share price behaviour expectations, information in the annual report is used via the expected effect on aggregate market valuation and behaviour. With regard to timing of company performance expectations, annual report information is only of limited use. The analyst obtains very little information from the annual report as to the timing within the next twelve months of company performance expectations.

Actual investment decisions are at times made on criteria other than those outlined above. Two examples should illustrate the point. A disinvestment recommendation was not acted upon because of the business which flowed from the investee company to the investor. In another case a disinvestment recommendation was not acted upon for 'personal' reasons at a senior level.

Concluding remarks

This paper provides a descriptive account of a real-life situation building a bridge between efficient markets studies and questionnaire surveys. The purpose was to investigate how accounting information and information from other sources, including the interaction between information from various sources, is used in the share investment decision process.

Despite the extensive use made of all information sources, the receipt of the annual report represents the major routine information event over the financial year. The use made of the annual report, and thus its significance as a major information source, changes during the year. At times it is used as a primary source of information while at other times it is used more in a confirmatory role. Furthermore, the annual report acts not only as a source of information to an inquiry but also provides the stimulus for identifying questions to be pursued via other sources. However, to view this changing role in terms of cyclical occurrences over a year would be an oversimplification.

---

[17] Several analysts expressed the opinion that the ignoring of market psychology is a deficiency of efficient market studies.

The choice of subject for this case study was intentionally biased towards an investor with a stated commitment towards fundamental annual report analysis. This bias was considered necessary because of the focus of the study. The focus was to gain a qualitative understanding in a particular situation rather than a quantitative understanding of general tendency for all participants in the market.

The findings in this study relate to a particular institutional investor. Based on subsequent discussions with other analysts, these findings are, however, also considered relevant to other institutional investors which have a similar commitment to, and engage in, fundamental analysis. The findings are likely to be less relevant to investors which do not have such a commitment.

References

Ahlers David M., *A New Look at Portfolio Management*, JAI Press, 1977.

Anderson R., 'The Usefulness of Annual Reports to Australian Investors', paper presented at the Accounting Association of Australia and New Zealand 1979 conference, University of Melbourne, Australia.

Anderson R., 'The Usefulness of Accounting and Other Information Disclosed in Corporate Annual Reports to Institutional Investors in Australia', *Accounting and Business Research*, Autumn 1981.

Arnold J. and P. Moizer, 'A Survey of the Methods Used by UK Investment Analysts to Appraise Investments in Ordinary Shares', *Accounting and Business Research*, Summer 1984.

Baker H. Kent and John A. Haslem, 'Information Needs of Individual Investors', *Journal of Accountancy*, November 1973.

Ball R. and P. Brown, 'An Empirical Evaluation of Accounting Income Numbers', *Journal of Accounting Research*, Autumn 1968.

Biggs S. F., 'An Empirical Investigation of the Information Processes Underlying Four Models of Choice Behavior', in T. J. Burns (ed), *Behavioral Experiments in Accounting II*, Papers, Critiques and Proceedings of the Accounting Symposium 1978, Ohio State University.

Bouchard Jr. T. J., 'Field Research Methods: Interviewing, Questionnaires, Participant Observation, Systematic Observation, Unobtrusive Measures', in M. D. Dunette (Ed), *Handbook of Industrial and Organization Psychology*, Rand Macnally College Publishing Co. 1976.

Bouwman M. J., 'Expert versus Novice Decision-Making in Accounting: A Process Analysis', Working Paper, University of Oregon, 1981.

Campbell D. T. and J. C. Stanley, *Experimental and Quasi-Experimental Designs for Research*, Rand Macnally, 1966.

Campbell D. T., '"Degrees of Freedom" and the Case Study', in Cook T. D. and C. S. Reichhardt (Eds), *Qualitative and Quantitative Methods in Evaluation Research*, Sage Publications, 1979.

Chang Lucia S. and Kenneth S. Most, *Financial Statement and Investment Decision*, Vol. 1 and 2, Florida International University, 1980.

Chenhall R. H. and R. Juchau, 'Investor Information Needs—An Australian Study', *Accounting and Business Research*, Spring 1977.

Connolly T., 'Information Processing and Decision Making in Organizations' in Shaw B. M. and G. R. Salancik (eds), *New Directions in Organizational Behavior*, St Clair Press, Chicago, Ill, 1977.

Cyert R. M. and J. G. March, *A Behavioral Theory of the Firm*, Prentice Hall, 1963.

Epstein Marc J., *The Usefulness of Annual Reports to Corporate Shareholders*, Bureau of Business and Economics Research, Los Angeles, 1975.

Finn F., *Internal Performance Evaluation of Managed Investment Funds*, PhD Dissertation, University of Queensland, 1981.

Glaser B. G. and A. L. Straus, *The Discovery of Grounded Theory*, Aldine, Chicago, 1967.

Hagg I. and G. Hedlund, Case Studies in Accounting Research, *Accounting, Organizations and Society*, Vol. 4, No. 1/2, 1979.

Hines R. D., 'The Usefulness of Annual Reports: The Anomaly between Efficient Markets Hypothesis and Shareholder Surveys', *Accounting and Business Research*, Autumn 1982.

Lee T. A. and D. P. Tweedie, *The Institutional Investor and Financial Information*, The Institute of Chartered Accountants in England and Wales, 1981.

Libby R., *Accounting and Human Information Processing: Theory and Applications*, Prentice Hall, 1981.

Lincoln Y. S. and E. G. Guba, *Naturalistic Inquiry*, Sage Publications, 1985.

McCall G. J. and J. L. Simmons (eds), *Issues in Participant Observation: A Text and Reader*, Addison-Wesley, 1969.

Mintzberg H., 'An Emerging Strategy of 'Direct' Research', *Administrative Science Quarterly*, December 1979.

Newell A. and H. A. Simon, *Human Problem Solving*, Prentice-Hall, 1972.

Patton M. Q., *Qualitative Evaluation Methods*, Sage Publications, 1980.

Peak H., 'Problems of Objective Observation', in L. Festinger and D. Katz (eds), *Research Methods in Behavioral Science*, Holt, Rinehart and Winston, 1966.

Webb E. J., Campbell D. T., Schwartz R. D. and L. Sechrest, *Unobtrusive Measures: Nonreactive Research in the Social Sciences*, Rand Macnally, 1966.

Weick K., 'Systematic Observation', in G. Lindzey and E. Aronson (eds), *Handbook of Social Psychology*, Vol II, Addison-Wesley, 1968.

Accounting and Business Research, Vol. 20, No. 79, pp. 231–239, 1990

Positive Accounting Theory as a Lakatosian Research Programme

Tom Mouck*

Abstract—'Positive accounting theory' fails to meet Popper's falsificationist criteria for scientific inquiry. This paper argues, however, that Lakatos' 'methodology of scientific research programmes' is superior to Popper's falsificationist methodology, and that 'positive accounting research' *does* meet Lakatos' criteria for 'scientific' status. Within Lakatos' philosophy of science, however, this claim does not necessarily represent an endorsement of positive accounting theory.

Watts and Zimmerman claim credibility for positive accounting theory (PAT) on the basis that it is scientific. Their claim has been disputed by Christenson (1983) who argued that their theories fail to pass Popper's criterion 'for demarking science from metaphysics' (p. 61). But Popper's criterion is widely considered to be inadequate. Among methodologists who regard science as having some special claim on credibility, the 'methodology of scientific research programmes' (MSRP) as develped by the late Imre Lakatos is considered to be a much more realistic basis for appraisal of scientific inquiry. My objectives in this paper, therefore, are to elucidate the differences between Popper's falsificationist methodology and Lakatos' MSRP, and to evaluate the (scientific) status of positive accounting theory as a Lakatosian research programme.

Popper's falsificationist methodology

Popper's view of philosophy of science represented a major retreat in the epistemological claims for science. Whereas positivist philosophy of science had held that the truth of scientific claims could be verified, Popper denies this claim because of its reliance on induction. An inductive inference can never be complete in and of itself because it has to be based on limited experience and future experience may contradict it. It is thus impossible to prove conclusively the truth of any theory. The most that can be hoped for, says Popper, is to prove the falsity of theories. This does not represent an abandonment of the ideal of truth. If theories are repeatedly subjected to attempts at falsification, then scientific knowledge can, at least, grow ever closer to the truth as false theories are rejected.

But the magnitude of Popper's epistemological retreat is even more serious than has just been indicated. For Popper further points out that even the falsity of a theory can never be empirically established in a logically conclusive sense. 'In point of fact, no conclusive disproof of a theory can ever be produced.... If you insist on strict proof (or strict disproof) in the empirical sciences, you will never benefit from experience, and never learn from it how wrong you are' (Popper, 1968, p. 50).

What can be establishd with logical conclusiveness is the consistency or inconsistency of a set of propositions. Thus, for an empirical science the relevant propositions can be sub-divided into theoretical propositions and observational propositions in such a way that their logical consistency or inconsistency can be readily determined. In Popper's falsificationist philosophy of science, a theory is considered to be 'falsified' when a contradictory observation statement is accepted (1968, p. 86).

An initial problem for this sort of falsificationism, if it claims to be both logical and empirical, is that it is not possible to deduce observational propositions from pure experience. Any observational proposition, Popper points out,

> ...[goes] far beyond what can be known with certainty 'on the basis of immediate experience'.... Every description uses universal names (or symbols, or ideas); every statement has the character of a theory, of a hypothesis. The statement, 'Here is a glass of water' cannot be verified by any observational experience. The reason is that the universals which appear in it cannot be correlated with any specific sense-experience. (An 'immediate experience' is only once 'immediately given'; it is unique.) By the word 'glass', for example, we denote physical bodies which exhibit a certain law-like behavior, and the same holds for the word 'water'.

---

*The author is assistant professor at the Anderson School of Management, University of New Mexico.

> Universals cannot be reduced to classes of experiences; they cannot be 'constituted'. (1968, pp. 94–95)

Furthermore, any proposition which reports sensory experience must rely on some theory of perception, and of course no theory of perception can ever be conclusively proven true because of the problem of induction. And any observations that rely on instruments (microscopes or telescopes, for instance) rely on additional theories (a theory of optics). In short, there is no realm of non-theoretical facts against which theories can be tested.

Popper's solution to these problems (and others) is to take a methodological decision, a decision to regard the supporting theories as 'unproblematic background knowledge'—'Let *h* be the hypothesis to be tested; let *e* be the test statement (the evidence), and *b* the 'background knowledge', that is to say, all those things which we accept (tentatively) as unproblematic while we are testing the theory' (Popper, 1965, p. 390).

Another type of methodological decision necessary for Popper's falsificationism concerns the acceptance of falsifying observations. For example, should a theory be considered falsified if a single scientist reported the occurrence of a falsifying event? What if two scientists simultaneously reported an observation of the event? And so forth. How many observations does it take to prove the accuracy of the observation? The answer is that no finite number of observations can provide conclusive proof of observational accuracy. Thus, Popper takes another methodological decision—a falsifying observational proposition is not eligible for acceptance unless it is based on a 'reproducible effect' (1968, pp. 86–87).

A similar problem is involved with probabilistic type theories—they can never be conclusively falsified. Thus, another methodological decision is necessary: a decision which specifies rejection rules (Popper, 1968, pp. 204–205).

But the most fundamental methodological decision in Popper's falsificationist philosophy is due to the fact that 'it is always possible to find some way of evading falsification, for example by introducing *ad hoc* auxiliary hypotheses, or by changing *ad hoc* a definition' (1968, p. 42). These and other 'conventionalist strategems' can always be used to try to improve the fit between one's theory and the empirical data. It is crucial, therefore, for Popper's falsificationist criteria for science that a methodological decision be taken which forbids any attempt to protect theories from falsificationism:

> We decide that if our system is threatened we will never save it by any kind of conventionalist strategem. Thus, we shall guard against exploiting the ever open possibility just mentioned of '... attaining for any chosen... system what is called its "correspondence with reality"'. (Popper, 1968, p. 82)

This methodological decision is designed to ensure that theories will be exposed 'to the fiercest struggle for survival' (Popper, 1968, p. 42). Thus, only the best theories survive.

One of Professor Christenson's most serious criticisms of the positive accounting theorists (the 'Rochester School') is that they violate Popper's most fundamental methodological rule:

> Contrary to the empirical method of subjecting theories to severe attempts to falsify them, the Rochester School introduces *ad hoc* arguments to excuse the failures of their theories. This tactic is a violation of the norms which, according to Popper... must be followed if a system of propositions is to be considered 'scientific'. (Christenson, 1983, p. 20)

As previously noted, however, Lakatos' methodology of scientific research programmes is considered by many philosophers of science to be superior to Popper's falsificationism.

The superiority of MSRP over falsificationism is usually argued in terms of fidelity to the actual history of scientific practice. An adequate methodological view of science must somehow account for the growth of complex theories as structured wholes of some sort. 'Historical study', it is said, 'reveals that the evolution and progress of major sciences exhibit a structure that is not captured by the inductivist or falsificationist accounts' (Chalmers, 1982, p. 77). Lakatos, on the other hand, is widely credited with providing such a methodological view. Furthermore, according to Chalmers, 'An embarrassing historical fact for falsificationists is that if their methodology had been strictly adhered to by scientists then those theories generally regarded as being among the best examples of scientific theories would never have been developed because they would have been rejected in their infancy' (1982, p. 66). In any case, positive accounting theory may be judged 'scientific' by Lakatos' criteria while failing to meet Popper's falsificationist criteria.

The methodology of scientific research programmes

Lakatos criticised Popper's falsificationist philosophy of science on the basis that it does not square with the actual history of scientific practice on at least two counts. First, Lakatos points out that under methodological falsificationism 'a test is—or must be made—a two-cornered fight between theory and experiment so that in the final confrontation only these two face each other... [whereas the] history of science suggests that... tests are—at least—three-cornered fights between rival theories and experiment. . . . ' (1970, p. 155). That is, in actual scientific practice a theory is never rejected on the basis of contradictory evidence unless an alternative theory is available to replace it. Second, according to methodological falsificationism, 'the only interesting outcome of such confrontation [a test of a theory] is (conclusive) falsification . . . [whereas in actual practice] some of the most interesting experiments result, *prima facie*, in confirmation rather than falsification'(Lakatos, 1970, p. 115).

Since no empirical theory can ever be conclusively proven either true or false, then the most that philosophy of science can hope to achieve is a methodology which can be used to 'reconstruct rationally' the history of scientific practice while offering guidelines for rational appraisal of ongoing scientific endeavours. 'Why aim at falsification at any price?', Lakatos asks (1970, p. 117), especially since it cannot be used to reconstruct rationally the history of scientific practice. 'Why not rather impose certain standards on the theoretical adjustments by which one is allowed to save a theory' (Lakatos, 1970, p. 117)? To this end Lakatos proposed the methodology of scientific research programmes (MSRP).

According to Lakatos, most of the significant series of theories in the growth of scientific knowledge are welded together into research programmes by a certain continuity of conceptual framework. Scientists working within a programme tend to work as if they had agreed at an early stage on a set of methodological rules. The most basic 'agreement' concerns the conceptual framework that will not be subject to rejection or modification. Lakatos characterises this as the 'hard core' of the programme (1970, p. 133).

Scientists working within a programme thus act as if they were following a set of methodological rules specifying which research paths to follow and which to avoid (Lakatos, 1970, p. 132). The most basic rule, which Lakatos terms the 'negative heuristic', forbids tests aimed directly at the hard core. The 'positive heuristic', which suggests the allowable research paths, can be summarised as follows:

> . . . we must use our ingenuity to articulate or even invent 'auxiliary hypotheses', which form a protective belt around this core. . . . It is this protective belt of auxiliary hypotheses which has to bear the brunt of tests and get adjusted and re-adjusted, or even completely replaced, to defend the thus-hardened core. (Lakatos, 1970, p. 133)

At first blush it would appear that Lakatos' characterisation of scientific practice would undermine any claims that science results in rational and empirical progress. But this is not the case. Lakatos provides guidelines for appraisal or work within a programme. He uses the term "problemshift" to characterise 'a series of theories, T(1), T(2), T(3), . . . where each subsequent theory results from adding auxiliary clauses to (or from semantical reinterpretations of) the previous theory in order to accommodate some anomaly. . . . ' (1970, p. 118). A problemshift may represent scientific progress or unscientific degeneration. A series of theories is considered to be a theoretically progressive problemshift 'if each new theory has some empirical content over its predecessor, that is, if it predicts some novel, hitherto unexpected fact' (Lakatos, 1970, p. 118). A theoretically progressive problemshift may or may not also be empirically progressive. It is empirically progressive 'if some of this excess empirical content is also corroborated, that is, if each new theory leads us to the actual discovery of some new fact' (Lakatos, 1970, p. 118). If a research programme is characterised by problemshifts that are not at least theoretically progressive, then the programme is degenerative and is properly characterised as 'psuedoscientific' (Lakatos, 1970, p. 118).

In the Lakatosian scheme (MSRP), evidence that a Popperian falsificationist might characterise as 'falsifying evidence' would merely be characterised as an anomaly to be explained later. And instead of abandoning theories because they have been 'falsified', MSRP says that theories should be abandoned only when a superior (more progressive) theory is available. In this case the old theory is not falsified, it has merely been superseded.

Positive accounting theory as a scientific research programme

Positive accounting theory (PAT) is a theory which purports to explain 'how the world is' with regulation of accounting practice and 'how the world would be' without regulation. As such, PAT relies on a broader theory of the economic world—the theory of neoclassical economics. In their book-length exposition *Positive Accounting Theory* (1986) Watts and Zimmerman note that:

> In attempting to build a theory of disclosure regulation, positive accounting researchers borrowed heavily from the economists. The rudimentary theory outlined in the following chapters not only assumes that politicians and regulator maximize their self-interest, but it uses the economists' theories based on that assumption. (1986, p. 180)

They also make it clear that Milton Friedman's famous essay 'The Methodology of Positive Economics' provided an authoritative inspiration for the methodology of PAT (Watts and Zimmerman, 1986, p. 8).

In Lakatosian terms, then, PAT is an extension of the 'Chicago version' of the neoclassical economics research programme. And the underlying assumptions which form the hard core of the neoclassical economics programme can be considered the hard core of PAT. This hard core has been described by economist Spiro J. Latsis as consisting of the following propositions:

> (i) Decision-makers have correct knowledge of their economic situation.
> (ii) Decision-makers prefer the best available alternative given their knowledge of the situation and of the means at their disposal.
> (iii) Given (i) and (ii), situations generate their internal 'logic' and decision-makers act appropriately to the logic of their situation.
> (iv) Economic units and structures display stable, coordinated behavior. (1976, p. 22)

These propositions can be taken as a beginning point for spelling out the hard core of the PAT research programme. But they are insufficient for a complete statement of PAT's hard core. Latsis was concerned with the specification of neoclassical economics in general as a form of situation-logic. But the 'Chicago version' of neoclassical economics is concerned with more than this. The Chicago school is concerned with demonstrating that market arrangements result in the most 'efficient' allocation of resources possible, where the term 'efficient' refers to obtaining the highest possible degree of satisfaction of individual wants with a given amount of scarce resources. For instance, obtaining the maximum number of units of certain specified consumer items from the given resources is efficient only if the goods produced are the most preferred goods. And since 'efficiency' has no concrete meaning if the preferences of consumers can be manipulated via the market system, another proposition must be added to those specified by Latsis:

> (v) The wants and preferences of individuals are autonomous with respect to the market system.

The hard core of the PAT progamme is still incomplete, however. Researchers in the PAT tradition are fundamentally concerned with a clear distinction between the public interest and private interests. To this end, the following assumption must be added to the hard core of the PAT programme:

> (vi) All decision-makers are motivated only by their narrowly defined self-interest and not by the public interest.

And finally, since positive accounting theory explicitly assumes a 'property rights' theory of the firm (Watts and Zimmerman, 1986, p. 198), one final component must be added to complete the hard core of the PAT programme:

> (vii) The firm is considered to be a nexus of (explicit or implicit) contracts among self-interested parties.

In summary, researchers within the PAT programme will not, by implicit agreement, engage in research aimed at discrediting the fundamental assumptions of neoclassical economics; nor will these assumptions be subject to modification. In Lakatosian terms these assumptions represent the hard core of the programme which is protected by an interlocking network of 'auxiliary hypotheses which ... bear the brunt of tests and get adjusted and re-adjusted, or even completely replaced, to defend the thus-hardened core' (Lakatos, 1970, p. 133).

The 'protective belt' (the auxiliary hypotheses) of the PAT programme includes the following: the efficient markets hypothesis; the capital asset pricing model; contracting and agency theory; the theory of rational expectations; and a theory of the political process. The protective belt, of course, includes many other hypotheses and theories, but these are the most prominent.

The efficient markets hypothesis (EMH) was fundamental to the formulation of positive accounting theory. In the words of Watts and Zimmerman:

> The EMH has important implications for the arguments that the lack of uniformity in accounting procedures enabled managers systematically to mislead capital markets and that accounting earnings are meaningless. Both arguments rest on the hypothesis that accounting reports are the only source of information on the firm. The EMH suggests that this sole source hypothesis is unlikely to be descriptive and that the stock market is not systematically misled by accounting earnings. (1986, p. 20)

The EMH thus provided accounting researchers with an opening for pursuing the deregulation of accounting procedures—an opening which was particularly attractive to accountants trained in 'Chicago-type' neoclassical economics. But the EMH has gone through some adjustments which resulted in the specification of three forms of EMH—the weak form, the semi-strong form, and the strong form. The weak form, briefly stated, states that no one can consistently earn an above average return by using information generated by securities markets (information such as price and volume of trading, etc.). The semi-strong form states that no one can consistently earn an above average return by relying on publicly available information. And the strong form states that no one can consistently earn an above average return even if they rely on information that is not publicly available. Positive accounting theory tends to straddle the line between the semi-strong form and the strong form of the EMH.

The capital assets pricing model (CAPM) also fulfils a crucial role in positive accounting theory. Since PAT is fundamentally concerned with demonstrating how the regulation of accounting practices interferes with the efficient allocation of resources (capital resources in this case), it has to have some kind of theoretical linkage between accounting numbers and capital asset prices (or values). The CAPM provides that linkage:

> Under the multiperiod CAPM, the market value of the firm is a function of the firm's expected future cash-flows and the expected rate of return. In the CAPM world . . . there is no reason to expect a change in an accounting procedure to carry any implications for cash flows. In that world there are no transactions costs, no costs of contracting and no information processing costs. Information is assumed costless and available to all investors. Since it costs investors the same amount (zero) to process accounting earnings calculated under different methods, there is no reason for a firm's manager to prefer one accounting method over another. So, without additional assumptions, an accounting change has no implications for stock prices in the CAPM world. (Watts and Zimmerman, 1986, p. 73)

But of course managers do prefer some accounting methods over others. And since positive accounting researchers are concerned with explaining why managers prefer some accounting methods over others, they introduce additional assumptions. The adoption of the theory of rational expectations, for instance, allows reserchers to relax the unrealistic assumption of the zero information costs.

According to the CAPM, investors make their buying and selling decisions on the basis of their expectations about the future cash flows accruing to various firms. Their expectations are formed on the basis of information they have obtained. But since information is costly in the real world, investors will, if they are rational, purchase information only up to the point where the cost of additional information is equal to its expected value (realised in the form of more accurate expectations). Researchers in the PAT tradition do, of course, make the assumption that investors are rational in obtaining information and in forming expectations. The theory of rational expectations is, of course, a component part of the EMH. But researchers in the PAT programme extend the theory to the market for managers (Watts and Zimmerman, 1986, pp. 183–185), the market for auditors (Watts and Zimmerman, 1986, p. 318), and even to the actors in the political process (Watts and Zimmerman, 1986, p. 227).

Positive accounting researchers also relax the CAPM assumption of zero contracting costs. In Chapter 8 of their 1986 book Watts and Zimmerman discuss the idea of the firm as a 'nexus of contracts'—contracts between managers and employees, owner-managers and outside shareholders, owner-managers and debt-holders, owner-managers and auditors, and so forth. They also discuss various contracting models that have been used in positive accounting research and present the PAT case that accounting numbers play an important role in the contracting process; frequently a role that has an impact on the cash flows accruing to various contracting parties. For instance, a manager's compensation may be contingent upon the firm's earnings. Likewise, dividends allowed under a debt contract may be contingent upon earnings, and so forth. In such cases, managers will prefer some accounting methods over others because of the impact on earnings and thus on cash flows.

The conjunction of these various theories has allowed positive researchers to deduce the following testable hypotheses which have been the basis for several studies:

> *Bonus plan hypothesis.* Ceteris paribus, managers of firms with bonus plans are more likely to choose accounting procedures that shift reported earnings from future periods to the current period. (Watts and Zimmerman, 1986, p. 208)
>
> *Debt/equity hypothesis.* Ceteris paribus, the larger a firm's debt/equity ratio, the more likely the firm's manager is to select accounting procedures that shift reported earnings from future periods to the current period. (Watts and Zimmerman, 1986, p. 216)

A third testable hypothesis has been deduced from a theory of the political process (Watts and Zimmerman, 1986, Ch. 10). This theory generates the notion that the larger a firm's earnings the more likely it is to come under political scrutiny which may result in new taxes or regulations which adversely affect cash flow. Watts and Zimmerman state this third hypothesis as follows:

> *Size Hypothesis.* Ceteris paribus, the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods. (1986, p. 235)

The testing of these various hypotheses, of course, requires numerous additional assumptions. For instance, in discussing one study Watts and Zimmerman point out that, 'Zmijewski and Hagerman assume that FIFO, straight-line depreciation, flowthrough treatment of the investment credit, and amortization periods of more than 30 years for past pension costs increase earnings' (1986, p. 249). All such additional assumptions are, in Lakatosian terms, part of the protective belt.

In summary, then, positive accounting theory can be outlined as a Lakatosian 'Scientific Research Programme' as follows:

> *The hard core* consists of the following propositions related to the 'Chicago version' of neoclassical economic theory:
>
> (i) Decision-makers have correct knowledge of their economic situation.
> (ii) Decision-makers prefer the best available alternative given their knowledge of the situation and of the means at their disposal.
> (iii) Given (i) and (ii), situations generate their internal 'logic' and decision-makers act appropriately to the logic of their situation.
> (iv) Economic units and structures display stable, coordinated behaviour.
> (v) The wants and preferences of individuals are autonomous with respect to the market system.
> (vi) All decision-makers are motivated by their narrowly defined self-interest and not by the public interest.
> (vii) The firm is considered to be a nexus of (explicit or implicit) contracts among self-interested parties.
>
> *The protective belt* consists of the following:
>
> (i) The efficient markets hypothesis.
> (ii) The capital assets pricing model.
> (iii) The theory of rational expectations.
> (iv) Contracting and agency theory.
> (v) A theory of the political process.
> (vi) Various empirically testable hypotheses.
> (vii) Various assumptions necessary to implement empirical testing.

The propositions of the hard core are not subjected to test, nor are they candidates for modification. The components of the protective belt, on the other hand, are candidates for modification or even replacement if necessary to protect the hard core of the programme.

Appraising the PAT programme

As quoted earlier, Christenson (1983, p. 20) has implied that PAT falls short of achieving 'scientific' status. This is a well-made criticism of Watts and Zimmerman since they claim methodological legitimacy on Popperian ground (1986, p. 8). But I shall argue that an appraisal on Lakatosian terms would not deny 'scientific' status to the PAT programme.

According to Lakatos' methodology of scientific research programmes, a programme would be judged as 'degenerative' or 'psuedoscientific' only if it is 'characterized by problemshifts that are not at least theoretically progressive... ' (Lakatos, 1970, p. 118). A 'problemshift' occurs when researchers make adjustments to their theories in response to observational anomalies. Such adjustments are considered to be 'theoretically progressive' if the adjusted set of theories 'predicts some novel, hitherto unexpected fact' (Lakatos, 1970, p. 118). A higher level of progressiveness can be claimed 'if some of this excess empirical content is also corroborated, that is, if each new theory leads us to the actual discovery of some new fact' (Lakatos, 1970, p. 118); the adjustment in this case can be classified as an 'empirically progressive problemshift'. In reviewing Watts and Zimmerman's (1986) historical account of the development of PAT one major problemshift in positive accounting research is quite evident—the shift that resulted from dropping the assumptions of zero information and contracting costs.

The impetus for positive accounting research, according to Watts and Zimmerman, was the 1968 study by Ball and Brown which used the EMH and a multi-period CAPM to investigate the relationship between accounting earnings and stock prices (Watts and Zimmerman, 1986, p. 37). The Ball and Brown study and several subsequent studies produced evidence 'that stock price changes for a given period (e.g., quarter or year) are associated with both the sign and magnitude of unexpected earnings for that period' (Watts and Zimmerman, 1986, p. 69). The Ball and Brown study and the subsequent related studies did not attempt to test the validity of the EMH; they merely assumed its validity and interpreted empirical findings accordingly.

Most accounting research that has been used to support the regulation of accounting practice has assumed (at least implicitly) that securities markets are inefficient in that they can be misled by earnings changes that result merely from changes in accounting procedures. The EMH represents a contradictory viewpoint. Watts and Zimmerman describe the contradictory hypotheses as follows:

> In combination with the capital asset pricing model (CAPM) and assumptions of zero transaction, contracting, and information costs and no taxes, the EMH predicts that no stock price changes are associated with certain voluntary changes in accounting procedures. This is called the '*no-effects*' *hypothesis*. The competing hypothesis (i.e., the stock market is systematically misled by accounting procedures) predicts that stock price changes are associated with those particular accounting changes. This is called the '*mechanistic*' *hypothesis*. (1986, p. 72)

A 1972 study by Kaplan and Roll was one of the first of several studies, according to Watts and Zimmerman (1986, p. 72), which attempted to discriminate between the two hypotheses. These studies produced inconclusive results, not only because some produced evidence in support of the 'no-effects' hypothesis while others produced evidence in support of the 'mechanistic' hypothesis, but also because they were plagued by methodological problems which cast doubt on the validity of their results (Watts and Zimmerman, 1986, pp. 108–109).

But the attempts to discriminate between the 'no-effects' and the 'mechanistic' hypotheses made positive researchers aware of a major anomaly. The studies uncovered several instances of entire industries changing accounting procedures under circumstances which, according to the EMH and the CAPM, could not be expected to produce any beneficial effect on stock prices. Since the positive researchers did accept the validity of the EMH, this represented an anomaly. This raised questions which 'led some researchers to drop the zero information and transaction costs assumptions... and use those costs to explain accounting changes' (Watts and Zimmerman, 1986, pp. 109–110). The result was, of course, the development of the interrelated set of theories described earlier and the three testable hypotheses (the bonus plan hypothesis, the debt/equity hypothesis, and the size hypothesis). In Lakatos' MSRP terminology, this undoubtedly represents a major problemshift.

But is it a 'progressive' problemshift? I would argue that it is. In the first place, the three hypotheses just mentioned represent predictions of 'novel, hitherto unexpected facts'. The 'size hypothesis', for instance, predicts that 'ceteris paribus, the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods.' To the extent that this represents a 'novel fact' it represents 'theoretical progress' in Lakatosian terms. But Watts and Zimmerman would probably claim that the PAT programme has also demonstrated 'empirical progressiveness' since, according to them, 'A large-scale study of firms' portfolios of procedures... finds evidence consistent with three simple hypotheses that have been relatively widely tested: the bonus plan, debt/equity, and size hypotheses...' (1986, p. 267). Furthermore Lakatos maintains that, 'Mature science consists of research programmes in which not only novel facts but, in an important sense, also novel auxiliary theories, are anticipated; mature science—unlike pedestrian trial-and-error—has "heuristic power"' (1970, p. 175). The major problemshift of the PAT programme fits well with this notion of science. In discussing the studies of the 'no-effects' hypothesis versus the 'mechanistic' hypothesis Watts and Zimmerman point out that, 'The evidence accumulated from the studies also leads to the development of new hypotheses about, and new perspectives on, accounting phenomena' (1986, p. 72).

Reservations and qualifications

In a recent article on 'Popper's Methodology' Ruth Hines warned against 'an unwarranted reverence for science and "the scientific method"' (1988, pp. 660–661). I share her concern. But since the 'Rochester School' has been especially blatant in promoting such reverence for science, it is ironic that I have defended their research programme (positive accounting theory) against charges of being unscientific. The irony is compounded by the fact that I have used Lakatos' views (which are critical of Popper's methodology) to defend the Rochester School which uses Popper's methodology to support their claim to scientific status. These apparent contradictions can be explained without lengthy discussion.

Christenson's 1983 article was very persuasive in arguing that the Rochester School fails to live up to its professed methodological ideal (Popperian falsificationism). But Christenson's article perpetuated a notion that is all too prevalent among accounting researchers—the notion that Popper's methodology is *the* scientific method. A basic objective of the present paper, therefore, was to undermine that perception by demonstrating that a given approach to inquiry ('positive' research) may be shown to be 'scientific' under one set of methodologial criteria (MSRP) even though it is clearly 'unscientific' under a different set of criteria (falsificationism). But I want to make it clear that this paper should not be interpreted as supporting the PAT research programme.

I agree with Hines that 'Christenson's (1983) criticisms of Watts and Zimmerman's theories remain valid without reliance on Popper...' (1988, p. 661). I would also claim that many of those criticisms retain their validity even though the Rochester School's research fulfils Lakatos' criteria for 'scientific' status. In other words, the conclusion that PAT is a 'progressive' research programme does not entail a conclusion that PAT is the only legitimate accounting research programme. Nor does it entail a conclusion that PAT is superior to (or worse than) any other research programme. A research programme that is currently judged to be progressive may ultimately prove to be degenerative. On the other hand, 'A new research programme which has just entered the competition may start by explaining "old facts" in a novel way but may take a very long time before it is seen to produce "genuinely novel" facts' (Lakatos, 1970, p. 156).

Considerations such as these 'stress the importance of methodological tolerance' (Lakatos, 1970, p. 157), which raises another reservation about the Rochester School. The Rochester School has a reputation for methodological intolerance. Before addressing this issue, however, it must be noted that Lakatos does not argue against dogmatism in all forms. A group of researchers (the Rochester School, for instance) may use the protective belt to protect a hard core that is held with dogmatic allegiance. Lakatos suggests that there is:

> nothing wrong with a group of... scientists conspiring to pack everything they can into their favourite research programme... with a sacred hard core. As long as their genius—and luck—enables them to expand their programme 'progressively', while sticking to its hard core, they are allowed to do it. And if a genius comes determined to replace ('progressively') a most uncontested and corroborated theory which he happens to dislike on philosophical, aesthetic or personal grounds, good luck to him. (1970, p. 187)

But Lakatos makes it clear that a *methodological* dogmatism that restricts competition among rival research programmes is counterproductive to the growth of scientific knowledge. And this is where the dogmatic tendencies of the Rochester School go against the Lakatosian grain. As Whittington has noted in a review article, 'The principle deficiency of their [Watts and Zimmerman's] book is that, in their enthusiasm for their own preferred type of work they denigrate the work of earlier accounting theorists and other contemporary researchers who adopt a different approach' (1987, p. 335). Their methodological intolerance is perhaps most blatant in the 1979 article by Watts and Zimmerman in which they characterise normative accounting theorists as responding to the demand for political excuses. In the words of Whitley, 'Watts & Zimmerman's *Positive Accounting Theory* is an attempt to... colonize doctoral programmes in accounting...' (1988, p. 643). In short, the Rochester School exhibits a tendency toward academic imperialism which is clearly contradictory to Lakatos' call for methodological tolerance.

In a different vein, I must point out that I am not suggesting that Lakatos' MSRP is the last word in philosophy of science. Lakatos was a major voice in the 'growth of knowledge' debate which followed the publication of Kuhn's *The Structure of Scientific Revolutions* in 1962: a debate which effectively laid positivist philosophy of science to rest. But Lakatos' methodological views have been challenged by a number of philosophers of science, the most flamboyant and outspoken being Paul Feyerabend. A brief reference to Feyerabend's views should be sufficient to indicate the scope of challenges to the notion that Lakatos has provided a definitive scientific methodology.

Feyerabend, a self-declared anarchist, claims 'that there is only one principle that can be defended under all circumstances and in all stages of human development. It is the principle: anything goes' (1975, p. 28). Pointing to Lakatos' arguments that new research programmes should be granted a 'breathing space' and that unanticipated developments may revive a research programme previously judged 'degenerative', Feyerabend maintains that 'there is no "rationally" describable difference between Lakatos and myself...' (1975, pp. 186–187). Lakatos' standards, he suggests, contain no rules that tell scientists what to do; nothing is ruled out.

Finally, I must express a reservation about the continuing emphasis on philosophy of natural science as a basis for accounting research methodology. Accounting has much more affinity with the social sciences than with the natural sciences, as is clearly exemplified by positive accounting theory with its basis in economic and political theory. And, as Whitley has pointed out, natural science methodology may not be relevant to social science methodology because, in addition to divergencies in basic goals, social science research is much more value-laden and interactive than natural science, and 'social phenomena and events are constituted by meanings and cultural conventions and vary accordingly' (1988, p. 636). Such issues deserve much more attention in the mainstream accounting literature.

The fact remains, however, that the mainstream of accounting research does tend to rely on philosophy of natural science generally and Popper's falsificationism specifically in arguing for methodological legitimacy. In this context, then, my objective is not to promote the adoption of Lakatos' MSRP, but to undermine the notion that there is such a thing as *the* scientific method. My intent is to help clear the way for an expansion of the dialogue concerning accounting methodology.

Conclusions

The conclusions of this paper can be stated very briefly. Lakatos' methodology of scientific research programmes is superior to Popper's falsificationist methodology not only because it is more descriptively accurate regarding the historical practice of science, but also because it embodies a higher level of methodological tolerance and a safeguard against dogmatism. Positive accounting theory provides an excellent case study for demonstrating Lakatos' methodological tolerance. Positive accounting theory can be shown to be a 'progressive' (e.g. 'scientific') research programme under Lakatos' methodology even though it must be judged 'unscientific' under the criteria of Popper's falsificationist methodology. These results are highly ironic in light of the fact that positive accounting researchers have gained a reputation for methodological intolerance, while citing Popper as support for their claims to legitimacy. Overall, these results should serve as an antidote for the 'unwarranted reverence for science and "the scientific method"' that, according to Hines (1988, pp. 660–661), is fostering an attitude of scientistic dogmatism among accounting researchers.

References

Chalmers, A. F. (1982), *What Is This Thing Called Science?* (New York: University of Queensland Press), 2nd ed.

Christenson, C. (1983), 'The Methodology of Positive Accounting', *Accounting Review*, January, pp. 1–22.

Feyerabend, Paul (1975), *Against Method* (London: Verso Editions).

Hines, Ruth D. (1988), 'Popper's Methodology of Falsificationism and Accounting Research', *Accounting Review*, October, pp. 657–62.

Lakatos, I. (1970), 'Falsification and the Methodology of Scientific Research Programmes' in I. Lakatos and A. Musgrave (eds.), *Criticism and the Growth of Knowledge* (Cambridge: Cambridge University Press), pp. 91–196.

Latsis, Spiro J. (1976), 'A Research Programme in Economics' in Spiro J. Latsis (ed.), *Method and Appraisal in Economics* (Cambridge: Cambridge University Press), pp. 1–41.

Popper, K. (1965), *Conjectures and Refutations* (New York: Basic Books).

Popper, K. (1968), *The Logic of Scientific Discovery* (New York: Harper & Row), translated ed.

Watts, R. L. and Zimmerman, J. L. (1979), 'The Demand for and Supply of Accounting Theories: The Market for Excuses', *Accounting Review*, April, pp. 273–305.

Watts, R. L. and Zimmerman, J. L. (1986), *Positive Accounting Theory* (Englewood Cliffs, NJ: Prentice-Hall).

Whitley, R. D. (1988), 'The Possibility and Utility of Positive Accounting Theory', *Accounting, Organizations and Society*, Vol. 13, No. 6, pp. 631–645.

Whittington, G. (1987), 'Positive Accounting: A Review Article', *Accounting and Business Research*, Vol. 17, No. 68, pp. 327–336.

Accounting and Business Research, Vol. 20, No. 79, pp. 240–244, 1990

A Note on the Disclosure Size Exemptions in Technical Release 706

Michael J. Mumford*

Abstract—This paper considers the proposal that certain items of financial disclosure in Britain should be restricted to public companies and 'large' private companies as defined by the Accounting Standards Committee in Technical Release number 706. Evidence is provided of the numbers of companies affected by this policy decision, to demonstrate the likely consequences of TR 706.

The UK Accounting Standards Committee (ASC) has been concerned for some years over the extent to which Statements of Standard Accounting Practice (SSAPs) need apply to smaller companies. Statements on the matter appeared in Technical Releases 690 and 706, and in a recent *ASC Report* (ASC, 1988a, 1988b and 1988c). The Dearing Report on setting accounting standards (ASC, 1988d) also discussed the issue, asking whether some SSAPs might be limited in scope, as in the cases of SSAPs 3, 10 and 16 (ASC, 1972, 1975, and 1980). However, the principles of exemption are not well-founded on any established constitution, arguments or evidence. The present note is designed to produce some relevant empirical evidence on the ASC proposal in Technical Release 706 (ASC, 1988c), drawn from three distinct data sources.

The scope of the problem

There are at present approximately 900,000 companies on the British register of companies. (ASC statements also apply to some other reporting entities, but these are ignored here.) About 895,000 companies are private and 5,200 public (of which about 2,700 are quoted, with some others being listed on the USM or Third Market).

The provisions of Section 248, Companies Act 1985 (now, with minor amendments, set out in Section 13, Companies Act 1989) allow small and medium-sized private companies to file modified accounts (permitting lower levels of disclosure, for example without the need for a full profit and loss account); the medium-sized company criteria are cited by the ASC in TR 706. These stipulate that a company cannot be allowed exemption from full disclosure if it is a public company or if it exceeds any two of the following size limits: turnover of £8 million, capital employed of £3.9 million, and 250 employees. These limits are based on the 4th Directive.

Information supplied by the DTI to the Dearing Committee (ASC, 1988d) showed that some 860,000 companies could be classed as 'small' (using a definition in the Act but not shown above), 27,000 as 'medium', and 13,000 as 'large'. Note that the Companies Act size exemptions apply only to private companies. There are no published figures to show how many of the 'large' companies are public and how many private. There cannot be fewer then 8,000 'large' private companies, since there are only 5,200 public companies in total and some of these are not 'large' by the s.248 definition (see Table 2 below).

The ASC proposed in TR 706 that some standards should be mandatory only for public companies and for the largest private companies. The exemption limits for private companies would be set at ten times the s.248 limits, i.e. turnover of £80 million, capital employed of £39 million, and 2,500 employees. TR 706 gives no estimate of the numbers affected by this policy, but clearly it exempts many more private companies than the Companies Act allows to file modified accounts. This is, of course, entirely legal since the ASC standards concerned will only relate to disclosures beyond legal minimum standards.

The Department of Trade and Industry (DTI) is responsible for administering much of company law, and it has an interest in the performance of the industrial and commercial sector of the economy. Statistics are published at intervals by the DTI Business Statistics Office in *Business Monitor MA* 3; the basis of these statistics is discussed in the quarterly journal *Statistical News*. As explained by Knight (1987) and by Knight and Jenkinson (1987), many of these figures are based upon an aggregated two-part sample. The first part comprises the 2,000 largest industrial and commercial groups and independent companies as a sample of 'top companies' (Knight, 1987). The second part consists of a 1 in 300 sample of other eligible industrial and commercial groups and companies, representing about 350,000 'smaller companies' (Knight and Jenkinson, 1987).

---

*The author is senior lecturer and research fellow, International Centre for Research in Accounting, University of Lancaster. He thanks the Chartered Association of Certified Accountants for a grant which enabled the empirical study to be undertaken; the Statistics Division of the DTI, Newport, Gwent; and in particular John Knight, Jean-Bruno Dufour, Margaret Berry and T. S. Ho of the University of Lancaster for computing assistance, and Ken Peasnell for helpful comments on an earlier draft.

Reference is made below both to DTI aggregate 1985 figures for a population of 370,719 companies (the 'first data source' below), and also to more detailed 1985 figures for a sub-group of 1,847 of the largest of these groups and companies (the 'third data source'). Neither of these data sets constitutes a random sample of companies registered under the Companies Act. Financial institutions are excluded; so are charities. Moreover, the precise legal status of each enterprise is not of prime interest to the DTI in studying industrial and commercial activity. Thus many registered companies which are subsidiaries of British registered groups only appear as part of the group figures. Consequently, many of the 900,000 registered companies are not included in the DTI sample even though most file accounts subject to ASC standards (Knight, 1987, p. 76. 16).

First Data Source

The DTI in its *Business Monitor MA3 'Company Finance'* (*Nineteenth Issue*) (DTI, 1988, pp. 62–63) shows the estimates for 1985 for a sample of 370,719 industrial and commercial groups and companies, including all the largest 2,000 (see Table 1).

Some companies overlap the three categories, e.g. both turnover and capital employed exceed £100m and employees exceed 1,000. The number of overlaps is not disclosed. But from the third data source, below, it is also common for companies with a turnover above £80 million to have a capital employed below £39 million, and vice versa. Moreover, many companies with a large turnover and capital employed have fewer than 1,000 employees.

Many private companies exceeding one of the three criteria will fall below both the other two and be exempted by TR 706. In particular, the number of employees rarely exceeds 2,500. Thus if fewer than 753 companies in total have more than 1,000 employees, and if a substantial proportion of these are public companies, very few private companies will be classified as large by this criterion.

Second Data Source: Jordan's Private Companies

Data presented in Jordan's 1988 surveys, *Britain's Top 2000 Privately Owned Companies* and *Britain's Second 2000 Privately Owned Companies* (Jordan and Sons, 1988a and 1988b) include for three recent years figures for turnover, for 'net tangible assets', and for employees. The companies themselves are listed by name, ranked in descending order of turnover in the latest year reported (usually 1987 or 1986, sometimes 1985).

It is important to note that the definition of 'private' used by Jordan's differs markedly from that used in the Companies Act and by the ASC. Within the Jordan's surveys:

> a privately owned company is a company controlled by individuals, whose equity capital is not officially listed on The Stock Exchange (the adoption by a company of 'The Public Limited Company' status does not, of course, disqualify it from inclusion).

It is thus necessary for present purposes to eliminate from the Jordan's lists those companies which appear to be public companies, judging by the appearance of 'PLC' after their name. Out of 4,000 companies included in the two volumes, 3,588 were left after removing public companies.

Examination of the lists show that, of the 3,588 private companies surveyed by Jordan's, only 30 exceed the TR 706 limits, and even to achieve this total it was necessary in some cases to choose years other than 1985. Nineteen of the 30 companies have above 2,500 employees. Seven of them[1]

Table 1. DTI size estimates, 1985

22,572	companies with a turnover between	£1–5 m
8,410	companies with a turnover between	5–25 m
922	companies with a turnover between	25–100 m
505	companies with a turnover over	100 m
14,617	companies with a capital employed between	£1–5 m
1,149	companies with a capital employed between	5–25 m
485	companies with a capital employed between	25–100 m
290	companies with a capital employed over	100 m
3,163	companies with employees between	200–1,000
510	companies with employees between	1,000–5,000
243	companies with employees over	5,000

---

[1] There were only six other companies in the two volumes of Jordan's surveys (i.e. 25 in total out of 3,588) which showed more than 2,500 employees.

qualify only because of the number of employees. However, private companies with more than 2,500 employees are in general very rare. Seventy two of the 3,588 private companies have a turnover above £80 million in any two of the three years reported, and 23 have 'net tangible assets' above £39 million in any two years. Thus the skewness which characterises 'top companies' amongst the 2000 studied by Knight (1987a) is also evident amongst private companies.

Third Data Source: A Detailed DTI Database

The data from the first two data sources provide valuable insights into the likely impact of TR 706. However, the first presents only aggregate data, while the second may perhaps omit some large companies.

Knight (1987) offered access to a tabulation of data for each of the largest 2000 companies for 1981. He was also able to supply a listing of 1985 data for a similar set of companies (including groups of companies) which reported the largest capital employed in 1981, were known to be live in 1982, and which also filed reports in 1985.[2]

Unfortunately, the definition of assets used by Jordan's does not coincide with 'capital employed' used by the DTI, defined in Knight (1987, p. 76. 17); nor, as seen, do the years always coincide. Nevertheless, some corroboration was possible.

This 1985 DTI sample includes 1,847 groups and companies drawn from amongst the 370,719 analysed in the *Business Monitor MA3*, referred to above. Of these 1,847 large companies, 1,022 were classified by the DTI as public companies and groups, and 825 as private companies. This is not, of course, a representative sample of all companies, nor even necessarily all large companies.

Table 2 shows how many of the 1,847 public and private companies exceeded various size limits in terms of turnover and capital employed. The 'factors' shown in the left column of the Table refer to multiples of the Companies Act 1985, s.248 limits for turnover and for capital employed, as shown in the columns to the right. Estimates of numbers of employees were not available from this source, although an attempt was made to trace these from Dun and Bradstreet (see below).

Of the sub-sample of 825 large private companies, 708 (86%) had a turnover above £8 m and 758 (92%) a capital employed above £3.9 m. Of the 1022 public companies and groups, 921 (90%) had a turnover above £8 m and 988 (97%) a capital above £3.9 m. However, when it comes to the TR 706 limits, out of the 825 large private companies, only 200 (24%) had a turnover above £80 m, and 168 (20%) had a capital employed above £39 m; whilst of the 1022 public companies only 386 (38%) had a turnover above £80 m, and 417 (41%) had capital above £39 m. These results suggest that the numbers are quite sensitive to the size criteria used for exemption.

Numbers of employees are not shown, but given the small number of companies with over 1,000 employees, turnover and capital employed are usually the only criteria that make a private company 'large'. A (private) company which exceeds the limit for only one variable will be exempted, even if it controls over £100 million in assets, like Hewlett-Packard Ltd or Tenneco International Holdings Ltd, or has sales above £400 m, like Renault (UK) Ltd.

Of the largest private companies mentioned above (i.e. exceeding 10 times the s.248 limits for turnover or capital), 71 out of the 200 companies (35%) with a turnover above £80 m have a capital below £39 m; and 39 out of the 168 companies (23%) with a capital above £39 m have a turnover below £80 m. Ignoring employees, this leaves 129 out of 825 in the sample categorised as large by TR 706.

Table 2. Number of companies exceeding specified multiples of the s.248 size exemption limits

Factor	*Turnover*	*Private*		*Public*		*Capital over*	*Private*		*Public*	
	£m	No.	%	No.	%	£m	No.	%	No.	%
10	80	200	24	386	38	39.0	168	20	417	41
9	72	215	26	403	39	35.1	183	22	436	43
8	64	240	29	427	42	31.2	200	24	466	46
7	56	268	33	470	46	27.3	226	27	509	50
6	48	294	36	515	50	23.4	255	31	548	54
5	40	334	41	554	54	19.5	291	35	590	58
4	32	381	46	619	61	15.6	336	41	659	65
3	24	454	55	691	68	11.7	422	51	733	72
2	16	555	67	791	77	7.8	534	65	839	82
1	8	708	86	921	90	3.9	758	92	988	97

Source: DTI large company 1985 database.

---

[2] The 1985 list was augmented by new large companies formed since the base year, for example by privatisation of public corporations, buy-outs, and subsidiaries newly formed in Britain by foreign holding companies.

Dun and Bradstreet (1988) was used to identify, where possible, numbers of employees in the companies included in the DTI list. Out of the 200 private companies shown in Table 2 with a turnover above £80 m, 51 appeared to have more than 2,500 employees. Exactly double that number (102) had below 2,500, and in 47 cases the number could not be traced. The search for employee numbers disclosed two companies out of the 153 traced which had a turnover above £80 m and more than 2,500 employees, although their capital employed was less than £39 m. None were found to qualify by capital and employee numbers. Thus two could be added to the total of 129 identified earlier. But no more than 131 (17%) would have to comply with SSAPs incorporating the size limits. Many companies which might be thought of as economically significant would escape disclosure requirements, for example, on the research and development expenditure, or segmental results (if the proposed standard adopts these limits). Indeed, probably no more then 150 or so out of the 8,000 private companies classed as 'large' by the s.248 criteria would exceed the TR 706 size limits.

As a final check, the 33 individual companies listed in Jordan's as large by TR 706 criteria were compared with the separate sample of 131 from 825 private companies in the DTI list. Nineteen appeared as large on both lists. The remaining 14 in Jordan's lists were either too small in terms of capital employed to appear in the DTI sample of 825 (six cases), or the companies did not appear at all in the DTI sample (eight cases). The eight discrepancies may represent subsidiaries of the groups of companies included in the DTI lists at group level, but the point was not explored further. Ninety eight companies appeared on the DTI list but were missing from Jordan's; most of these appeared to be British subsidiaries of overseas parent companies, not classed as 'privately owned' by Jordan's. Many more than 98 British subsidiaries of overseas parents appeared in the entire third data source, and these would be exempted by TR 706 provided they were registered here as private companies.

Indeed, the TR 706 size limits are so large that, judged by the evidence in Table 1, only 324 out of the largest 1022 public companies in the DTI sample (less than one third) would have to disclose if the same limits were applied to them too.[3] Given the economic importance of many of the large private companies which would be exempted by TR 706, the criteria appear unreasonably high. Whilst all 5,200 public companies would be required to provide full dislosure, private companies like Fiat Auto, Olivetti, Polaroid, SAAB and SKF (all UK subsidiaries of major overseas groups) would apparently not. Indeed, to take the food industry as an example, companies evidently exempted include Amalgamated Foods, Anchor Foods, Beatrice Swift, Buitoni, Del Monte, Fyffes, Kraft, Nabisco, and Weetabix, to list but a few household names.

However, empirical evidence is still lacking on another criterion incorporated in TR 706. All public companies are excluded from the scope of the exemptions, but so too is ' a holding company that has a public limited company as a subsidiary'. It is unclear how many additional private companies would lose the exemption offered by TR 706 because of this provision. This would have been difficult to establish under the Companies Act 1985; given the broader definition of a subsidiary in the Companies Act 1989, there appear to be insuperable problems in estimating the effect of this provision.

Conclusion

The estimates above of the numbers of companies affected by TR 706 (about 150 private companies) do not dictate any definite policy conclusions. If it is accepted that relatively small companies should be exempted from having to comply with all ASC standards, there may be a case for adopting the s.248 criteria as they stand. After all, as the Dearing Report points out, the 13,000 companies thus defined as large still represent no more than the number of American companies subject to far more stringent regulation by the Securities and Exchange Commission.

Furthermore, it appears that some major international groups operate within Britain through subsidiary companies which are significant within particular markets, but are registered as private companies and fall below two of the TR 706 criteria. A few were referred to above. If it is the case that confidentiality is important commercially, it seems odd to offer protection to such large businesses at the expense of competitors which happen to be public companies; if there is no problem with confidentiality, then there is no need for TR 706 to provide protection.

The more precise are the stated grounds on which policy is based, the better the prospects for adducing empirical evidence to use in refining, supporting or amending them. While this is no substitute for a conceptual framework, the use of a well-founded empirical base can enhance the value of such a framework as a set of working hypotheses for the future. The purpose of this note has been to provide some input to the discussion of TR 706 which has formerly been missing.

---

[3] Many public companies are neither quoted on the Stock Exchange nor eligible for a quotation because of their small size. The Stock Exchange rules for listing currently require a company to have a paid up capital of not less than £250,000, amongst other criteria, whereas a public company only needs a minimum capital of £50,000.

References

Accounting Standards (Steering) Committee (1972), *Statement of Standard Accounting Practice No. 3* 'Earnings per share', London, Accounting Standards [Steering] Committee.

Accounting Standards Committee (1975), *Statement of Standard Accounting Practice No. 10* 'Statements of source and application of funds', London, Accounting Standards Committee.

Accounting Standards Committee (1980), *Statement of Standard Accounting Practice No 16* 'Current cost accounting', London, Accounting Standards Committee.

Accounting Standards Committee (1988a), *Technical Release 690*, 'Statement by the Accounting Standards Committee on the application of accounting standards to small companies', London, Accounting Standards Committee, February 1988.

Accounting Standards Committee (1988b), *ASC Report No 3*, (The Bulletin of the Accounting Standards Committee), June 1988.

Accounting Standards Committee (1988c), *Technical Release 706* 'Statement by the Accounting Standards Committee on the definition of 'small company' for the purpose of applying accounting standards', London, Accounting Standards Committee, July 1988.

Accounting Standards Committee (1988d), *The Making of Accounting Standards: Report of the Review Committee*, (the 'Dearing Report'), London, Accounting Standards Committee, September 1988.

Department of Trade and Industry (1988), *Business Monitor MA3 'Company Finance' Nineteenth Issue*, London, HMSO, August 1988.

Dun and Bradstreet (1988), *Key British Enterprises 1988; Britain's Top 25,000 Companies*, London, Dun and Bradstreet Ltd, Vols. 1 & 2.

Jordan and Sons (1988a), *Britain's Top 2000 Privately Owned Companies*, London, Jordan and Sons.

Jordan and Sons (1988b), *Britain's Second 2000 Privately Owned Companies*, London, Jordan and Sons.

Knight, John (1987), 'Top Companies in the DTI Company Accounts Analysis', *CSO Statistical News* No 76, HMSO, February 1987, pp. 16–19.

Knight, John and Graham Jenkinson (1987), 'Smaller Companies in the DTI Company Accounts Analysis', *CSO Statistical News* No 77, HMSO, May 1987, pp. 11–14.

Accounting and Business Research, Vol. 20, No. 79, pp. 245–252, 1990

Towards a Comprehensive Accounting for Convertible Debt

Derek E. Purdy*

Abstract—Although convertible debt is an old and quite well-used form of finance, its accounting treatment has been almost ignored by those who set standards in the United Kingdom. The recent Technical Release TR 677 observed that there is a problem with convertible debt. The problem is that, after it has been issued by a company, the obligations of the company to third parties may change through time. This paper suggests that one approach to the problem is to follow a finance model of convertible debt, and to allow the accounting to develop from this. Accordingly, convertible debt may be considered on the basis of either equivalent straight debt or equivalent equity. The paper concludes with the suggestion that the accounting for convertible debt could be on the mixed basis or either the debt or the equity, but that this would be determined by the condition of the convertible debt at the date of the accounts.

Introduction

Companies have been issuing convertible debt in the United Kingdom on the London Stock Exchange for nearly sixty five years (Purdy, 1981, p. 17) and yet a Technical Release (TR 677), Accounting for Complex Capital Issues (Institute of Chartered Accountants in England and Wales, 1987), recently appeared to bemoan that there was no consistent and appropriate accounting treatment for convertible debt, amongst various forms of complex capital issues.[1] The appearance of this Technical Release is the stimulus for this paper. The thrust here is to argue the case for a particular structure and approach in order to provide one method which will provide a consistent and an appropriate accounting treatment for convertible debt. This is not the only structure and approach which can be adopted, but it is based upon some internally consistent logic from the literature. The obvious advantage is that this is an argument rehearsed away from the pressures of daily life dictating that one approach is more expedient than another.

Technical release TR 677 and convertible debt

It would appear that the central problem of TR 677 is that when convertible debt is raised the nature of the finance instrument is such that the obligations to third parties may change with time. In turn this means that the accounting for the convertible debt may depend upon future events which cannot be predicted with certainty. Consequently the TR notes that the agreed accounting procedures either have not kept pace with the development of the forms of convertible debt, are so simplistic that they do not reflect the benefits from using the debt, or are so complex as to obscure the financial statements for the reader.

The aim of the TR is to improve the communication of financial information, when convertible debt is used, through principles which allow consistent treatment and notes which explain these.

The TR considers that the following general principles should apply:

1. The balance sheet should increase by the net amount of equity or loan capital subscribed, after writing off any proper expenditure to a share premium account.
2. Unless there are good economic reasons for taking another approach, the total annual charge should be based upon the effective annual rate throughout the whole period of the loan, or related to the best available estimates where the date or the amount of the repayment is uncertain.
3. Where the transaction has a number of constituent parts the accounting treatment of each should be considered separately, but should have regard to the true commercial effect of the transaction taken as a whole.
4. The financial statements should disclose sufficient information about convertible debt for a reader to appreciate its nature and impact, so that its market value at the date of the balance sheet may prove useful.

---

*The author is lecturer in accounting at the University of Reading. He would like to thank Professor Chris Nobes and an anonymous reviewer for their comments on an earlier draft.

[1] It has been observed that convertible debt has existed in the UK for a long time but that it has not always been prominent (Sparrow, 1969). Since convertible debt appears to come into and then go out of prominence and is, therefore, transitory, this may be one reason for the lack of a clear policy on its treatment in company accounts.

The view of the TR about convertible debt is that equity holders are allowing shares to be taken up in the future at less than full value, thus diluting their holdings in exchange for a reduction in interest costs in the intervening period. The TR recommends that, where there is no material reduction in interest, the interest be charged directly to the profit and loss account. However, when the reduction is material then the treatment is to adjust the profit and loss account in order to charge a fair interest cost, the difference being a payment for an option.

The TR suggests that, where the convertible debt holder has the opportunity to continue to convert or continue with debt at a higher rate of interest retrospective from the date of issue, the augmented interest should be charged in the profit and loss account until the holder has made a decision. If the right to the augmented interest is not exercised, the augmented interest should be treated as part of the proceeds of an issue of shares. This appears to be a more comprehensive treatment of convertible debt than the earlier SSAP 3 (ASSC, 1974), since it does recognise the differential in interest rates (Purdy, 1977a).

A model of convertible debt

It is suggested that a suitable working definition of a convertible security, such as convertible debt, is a security which is issued as a fixed interest security and at least part of which is, at the option of the holder and under pre-determined conditions, exchangeable for another specified security which is normally thought to be riskier than the original security, and is usually in the same company. This definition builds upon the definitions provided by Rollins (1909), Dewing (1941) and Harold (1952).

There may be several reasons why a company issues convertible debt (Purdy, 1977b), but these are not all pursued here. Consequently, briefly, the logic to convertible debt is taken from the point that a company decides to issue this security. It is found that the coupon, or interest rate, on the convertible debt is considered to be lower than that of company straight debt of otherwise identical quality to the convertible debt. Thus, there is an interest rate differential due to the convertibility of the debt. It would appear that debt holders are forgoing some short-term interest in order to acquire equity in the future.

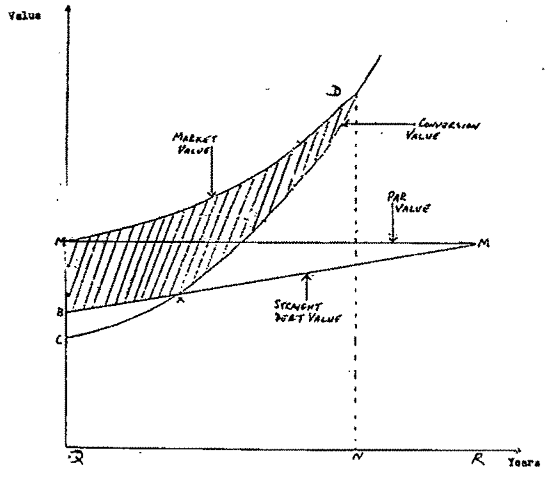
A second feature of the convertible debt is that it can be converted into a number of ordinary shares of the company. When the issue value of the convertible debt is compared with the current market value of the number of ordinary shares per unit of convertible debt issued, the market value of the shares is less than the market value of the debt. Put another way, the issue price of the convertible debt is less than the conversion value at the date of the issue. It would appear that debt holders are accepting a reduction in one base of their debt since the conversion value is less than the issue value.

Following the analysis of Brigham (1966) the convertible debt has three potential bases of valuation. There is the market value of the convertible debt, the conversion value of the underlying equity, and the convertible debt valued as if it were straight debt. These features are shown in Figure 1, the hypothetical life of a convertible debt. This is an adaptation of Brigham (1966).

Figure 1 shows convertible debt issued at a value of *M*, an assumed par value which will continue throughout the life of the convertible debt from *Q* to *R*. This *M* is the redemption value of the debt if it is not converted. It is assumed that the market value of the underlying equity, the conversion value, starts at point *C* and through time the value of the equity rises; consequently the conversion value increases. It is considered that, as the conversion value increases, so the market value of the convertible debt starts at point *M* and also increases. The increases in *C* and *M* continue until point *D*. At this point conversion value is the same as the market value of the convertible debt, and so holders of the convertible debt exercise their option to convert on one of the specified conversion dates. This is because holding the equity either has, or will have, a higher value. If for any reason these events do not occur, it is possible for the convertible debt to be valued as if it were equivalent to straight debt at any time. Assuming the interest rate remains the same, the value of the equivalent to straight debt will be less than that anticipated for the convertible debt. This value is represented by the line *BM*.

Brigham showed that the convertible security could be valued in two ways: (i) on the basis of the

Figure 1 The Hypothetical Life of Convertible Debt



straight, fixed interest, debt B, valued as debt at a time t:

$$B_t = \sum_{k=1}^{(T-t)} \frac{1}{(1+i)^k} + \frac{M}{(1+i)^{(T-1)}} \qquad (1)$$

where,

T = the original term to maturity
I = the interest paid each year
M = the redemption value at maturity
i = the market interest rate on equivalent risk, pure debt issues

or (ii) on the basis of the underlying equity C, valued as equity at a time t:

$$C_t = P_0(1+g)^t R \qquad (2)$$

where,

R = the number of shares receivable on conversion
P_0 = the share price at the time the convertible security was issued
g = the growth rate of the share price.

In the United Kingdom a study of merchant banks and stockbrokers found differences in the way in which convertible debt is regarded. Merchant banks tend to regard it more as an independent stock or debt, whilst stockbrokers tend to regard it more as equity (Purdy, 1977b). Consequently convertible debt appears to have a very strong duality to its nature.[2]

Some issues to be addressed

Using these notions of duality and the notions of Brigham (1966), it is possible to form a model which is an acceptable representation of convertible debt. From such a model it should be possible to base an accounting policy for convertible debt. Accordingly a number of accounting issues arise:

1. Since this security has the dual nature of debt and equity, what is the position of convertible debt on the balance sheet; is it grouped with debt or with equity?
2. Given this duality, how should the security be valued for the balance sheet?
3. When convertible debt is issued there is a difference between the interest rate applied to convertible debt and its equivalent straight debt; therefore, how should this difference be revealed? What treatment should be given to the possible reversion in interest rate from that paid for convertible debt to that paid as an equivalent straight debt?
4. Since this security has the possibility of increasing a company's equity, how should the earnings per share be calculated?

Previous accounting models

This section briefly reviews the work concerned with accounting for convertible debt. In the United Kingdom this is limited, and the larger body of literature from the United States is reviewed first. The consideration of the different bases of convertible debt was clearly a very contentious issue in the 1960s in the USA. As the following will indicate, the Accounting Principles Board initially took one view, then another. The latter position is extant with the Financial Accounting Standards Board.

The equivalent straight debt value for convertible debt is shown in equation (1) above. This has been used in accounting in the United States to ascertain the premium or discount at the time of issue of a straight debt security (Davidson, Schindler, Stickney and Weil, 1976). This premium or discount is written off over the life of the debt in accordance with professional recommendations (American Institute of Certified Public Accountants, 1968). However, the earlier view of the Accounting Principles Board was that it should be valued as equity. Accounting Principles Board Opinion No. 10 (APB 10) argued that part of the proceeds was a 'call' on the shares which arose due to the conversion privilege, and it should be accounted for as paid-in capital (APB, 1966).

There appeared to be a problem with the implementation of Opinion 10 in relation to convertible debt, because of the estimation of the value of the option to convert,[3] and so this treatment was temporarily suspended by Opinion 12 (APB, 1967). There was a lot of research activity around convertible debt at this time, as well as many views, some of which were quietened by the issue of Opinion 14 (APB, 1969).

Currently APB Opinion 14 considers that the reporting of the proceeds of convertible debt should not include any amount attributable to equity. It took the view that the elements of the convertible debt were inseparable, had no independent existence and, therefore, no value could be assigned to these in the market place. The Board considered that convertible debt is a form of debt and that no premium or discount is to be reported, as any equivalent straight debt interest rate is unacceptable (APB, 1969).

---

[2] A reviewer has suggested that 'debt holders are forgoing interest in exchange for an option to acquire equity in the future'. The author agrees that this construction could also be placed upon convertible debt so that it could be valued on the basis of an option.

[3] Although McCullers (1969) surveyed the accounting journals for several months after Opinion 10 had been issued, he could find neither articles nor letters to the editors which criticised the treatment of convertible debt advocated by Opinion 10. Savoie (1968) observed that a pressure group of the largest law and investment banking firms objected because of the practical problems of valuing the conversion feature.

Opinion 14 is not without its critics. Ford observes that, because the convertible is treated solely as debt, the call has a value of zero, something which would only be a correct evaluation of the conversion feature in extremely remote situations. He observes that the reasoning of Opinion 14 is that issuers dispute their ability to determine subjectively a straight debt equivalent to convertible debt. This is because such a security could not be sold at a price which the issuer would regard as producing an acceptable financing cost. This argument provides conclusive proof that the conversion feature has an economic value separate from that of the debt and this should be recognised in accounting for the proceeds (Ford, 1969).

Others have suggested that a less traditional approach is required. The approach of Imdieke and Weygandt (1969) is to examine the intent of management. Consequently, where management's intention is to secure equity from the issue of convertible debt, then management only intends to make interest payments until conversion occurs. They suggest that the only liability to creditors which is present in the proceeds of an issue of convertible debt is the present value of the interest payments expected to be made until the conversion date, and that the balance of the proceeds represents paid-in capital. This method of reporting uses Brigham's second equation above to calculate the time to conversion, which has to make an assumption about the growth rate in the equity. From a practical point of view the difficulties with this method are the estimations, and its lack of recognition of the legal liability to repay the par value of the convertible debt.

However, by extending the work of Weil, Segall and Green (1968), Handy demonstrated that a premium was paid on convertible debt because of the conversion feature into equity and not because of its straight debt value. By extension of this, along with other observations, he reasoned that both the issuers of, and investors in, convertible debt were primarily interested in obtaining equity, and that accordingly the premium is the difference between the market value and the conversion value of the convertible (Handy, 1970). This was in contrast to the premium calculated according to the method of Opinion 10, which was the difference between the market value of the convertible and its equivalent straight debt value.

The proposals of Opinion 10 and Handy (1970) lie between Opinion 14, which considers the convertible to be basically debt, and Imdieke and Weygandt (1969) who consider that it is basically equity. Opinion 10 and Handy attempt to recognise that there are debt and equity components at the same time.

In the United Kingdom there is evidence to suggest that the convertible debt is not regarded solely as debt, even though it is grouped with straight debt in balance sheets. Skerratt (1971) found that, at the date of issue of convertible debt, there were lower coupons on the convertible debt than one would expect to find on equivalent straight debt in balance sheets. This difference in the coupon was found to be a function of the issue terms. One of these terms was the premium, the difference between the price of the convertible debt and its conversion value. It has also been found that the variation in the market price of convertible debt is largely explained by its conversion value, that is the price of the underlying equity (Brealey and Hodges, 1972; Bird, 1973; and Skerratt, 1974). A study with a small sample of merchant bankers and stockbrokers indicated that 50% considered it deferred equity, 33% considered it an independent stock and 17% a debt (Purdy, 1977b). Clearly there is a variety of views about the nature of this security. It has been suggested that the difference between the actual interest paid on the convertible debt and an equivalent straight debt should be deducted from the profit and loss account in order to provide 'full debt' earnings per share (Purdy, 1977a).

Recommendations

TR 677 has been the stimulus for this paper and these recommendations follow the context set down in the TR without alteration.[4] The literature has indicated an adequate hypothetical model of convertible debt, and work in both the United States and the United Kingdom indicates that individuals can regard this security as equity, or independently, and not simply as debt. Consequently this paper follows the route of Opinion 10 and Handy in recognising that there are debt and equity components at the same time, and extends their notions.

It would seem that, because this security has the duality of debt and equity, it needs to be shown on the balance sheet between debt and equity. However, this paper takes the view that the proceeds of a convertible debt issue require to be reported upon a basis which depends upon conversion value being above or below straight debt value. Thus, it could be that initially the convertible debt is treated on the basis of debt, because conversion value is below straight debt value. However, after a couple of years, when perhaps conversion value is above the straight debt value, it is then treated on the basis of equity.

---

[4] However, the notion in the TR is that the equity holders are diluting their holdings in exchange for a reduction in interest costs in the intervening period. Presumably, this is some material reduction in interest costs, as far as the company is concerned, for otherwise why would the company want to issue a convertible debt security? So it is difficult for the author to envisage occasions when a convertible could be issued without such a reduction.

It seems that it is only in this way that the accounting treatment will capture the dual nature of convertible debt at various points in its existence. At the same time, at any reporting date, this method would reflect the basis of the convertible debt's market valuation. This is illustrated in the following example.

It is assumed that a convertible debt is issued with an interest rate of 8%, redeemable after 10 years at £100 and the right to convert over a 5-year period during the fourth to eighth years. The bankers to the issue express an opinion that the equivalent straight debt would have an interest rate of 10%. This information is used in conjunction with equation 1 above and produces a straight debt value of £87.71 and a total debt discount which would be amortised over the 10 years of £12.29. The calculation of the total discount can be found in the Appendix.

It is assumed, further, that the conversion value is below the straight debt value at issue, and that each £100 of convertible debt is convertible into 33 shares which were selling for £2.495 each on the issue date. By setting the investment value, in equation 1 above, to be equal to the conversion value at the issue date, that is 33 shares × £2.495 = £82.34, it is possible to calculate the present value discount rate which equates the conversion value with the future cash interest of the debt. This is found to be 11%; it assumes no conversion before maturity, and a total discount of £17.63 would be amortised over the 10 years. (Allowing for rounding, the present value of £100 at 11% over 10 years is £82.37.) The calculation of the total discount is set out in the Appendix.

As a result of these simple operations there are now two sets of data about the convertible debt, one based upon straight debt, the other on equity. Thus, the balance sheet at the date of issue would show the total issue proceeds at £100.00 less the discount on debt of £12.29. At the same time there would be a Capital Reserve of £12.29. If the equity base were used, the balance sheet at the date of issue would show total issue proceeds as £100.00 less the discount of £17.63. There would be also a Call in Advance of £17.63. The creation of the Capital Reserve and the Call in Advance accounts represents the preservation of the double entry and the integrity of the credit amounts received from the convertible debt. There is no difference between these accounts, except for the origin of their creation, so that on the equity basis this capital is an advance payment, whilst on the debt basis the discount is capitalised. This is shown in Table 1.

Now it is assumed that at the end of year 2 the conversion value has risen above the equivalent straight debt value, £89.33. This is Discount on Debt initially, plus two years' amortisation, £87.71 + £0.77 + £0.85 = £89.33. In order to follow the accounting treatment advocated here (to treat as debt when conversion value is below equivalent straight debt, but when above to treat as equity) the amortisation of the discount would change from the debt to the equity basis. This change could start immediately which means that, at the end of the first year, the discount would have been treated and reported on the basis of debt, and at the end of the second year on the basis of equity. The effect of changing the basis at the end of year 2 runs in the following manner and is shown in Table 2.

At the end of year 2 there remains unamortised discount of £10.67; this is on the debt basis of present value discounted at 10%. However, on the basis of equity this requires moving the base to 11%; this means that at the end of year 2 the unamortised discount is £15.39. Thus, in moving the base, additional unamortised discount is created; this is £4.72, and is arrived at from the difference between the discount on the debt basis (£10.67) and the equity basis (£15.39). This difference can be credited to a Call in Advance Account because this clearly reflects the change in accounting policy towards the convertible from a debt base to an equity base in the balance sheet. This Call in Advance Account is derived from the Capital Reserve of £12.29 to which is added the difference £4.72, making £17.01. Table 2 shows the balance sheet of the company at the end of year 2 with the amounts stated on the three different bases.

Table 1
Treatment of Convertible Debt on One of Two Bases
Initial Balance Sheet

		Debt Base		*Equity Base*
Capital Reserve		12.29		
Call in Advance				17.63
Convertible Debt	100.00		100.00	
Less Discount on Debt	12.29	87.71	17.63	82.37
		£100.00		£100.00

Table 2
Treatment of Convertible Debt on One of Three Bases
The Balance Sheet at the End of the Second Year

		Debt Base		*Equity Base*		*Mixed Base*
Capital Reserve		12.29				
Call in Advance				17.63		17.01
Convertible Debt	100.00		100.00		100.00	
Less Discount on Debt	10.67	89.33	15.39	£84.61	15.39	84.61
		£101.62		£102.24		£101.62

The calculations of the discounts can be found in the Appendix.

If at the end of year 3 the conversion value has fallen below the equivalent straight debt value, the Mixed Base would require the debt basis. The balance sheet at the end of year 3 is shown in Table 3, and the calculations can be found in the Appendix. It can be seen that on the Mixed Base the Call in Advance Account now has become a Capital Reserve. This obviously necessitates the reversal of the entries forming the Call in Advance Account at the end of year 2. It requires the recreation of the Capital Reserve, £12.29, and the reversal of the entry for the previously unamortised discount, £4.72.

From the three Tables it can be seen that the total book value of the Capital Reserve, the Convertible Debt and the Discount on Debt has increased each year and will continue to increase. The total already exceeds the redemption value of the convertible debt.

Under existing English law, some of the adjustments advocated in this paper would violate the restrictions placed upon capital reserves. Consequently, in order to preserve flexibility, it would be necessary for all of the above accounts to be kept as non-distributable reserves, and appropriately named. For example, the Capital Reserve could be styled the Reserve of Effective Discount on Convertible Debt, and the Call in Advance, the Effective Call in Advance.

The proposals contained in this paper require bankers to state their opinion about the interest rate that would be required on an equivalent straight debt at the time of issue of the convertible debt. It may be that the issue terms allow the holder of the convertible debt to forgo the right to convert into shares and permit the convertible to become straight debt. At this stage the holder would receive a higher rate of interest to be effective and backdated from the issue date.

This type of clause acts as a form of 'fair trading'. Where the original expectations of conversion to the equity are not realised, probably because the underlying equity has not increased in value to a sufficiently high level, the holder of the convertible would be left with a straight debt security and a relatively low interest rate. Since this was not the intention of either of the sides at the time of the issue, this provides an opportunity to rectify the position.[5] It is likely that the retrospective rate of interest would be at least at the same level as an equivalent straight debt. In such a situation, and using the recommendations above, the convertible debt would already be recorded on the balance sheet on the basis of this straight debt. If the retrospective rate of interest was higher than that of the equivalent straight debt, the logic applied in the earlier sections suggests that the convertible should be valued on the basis either of equity or as debt at the retrospective interest rate.

Table 3
Treatment of Convertible Debt on One of Three Bases
The Balance Sheet at the End of the Third Year

		Debt Base		*Equity Base*		*Mixed Base*
Capital Reserve		12.29				12.29
Call in Advance				17.63		
Convertible Debt	100.00		100.00		100.00	
Less Discount on Debt	9.74	90.26	14.10	£85.90	9.74	90.26
		£102.55		£103.53		£102.55

---

[5] These type of clauses have arisen because of an increase in the number of issues of convertible debt where the value of the underlying equity was too low to induce conversion. As a consequence the holders of such securities received neither the anticipated equity, nor the 'normal' interest rate for straight debt. Such clauses may also act as a reminder to the management of a company that failure to achieve conversion results in higher interest payments over a longer period.

Summary and conclusions

This paper has considered the issue of accounting for convertible debt within the context set out in Technical Release 677. However, the accounting treatment suggested here is different. The paper has concentrated upon the representation of convertible debt on the balance sheet, but its recommendations are as vulnerable to challenge as other accountings. Essentially the recommendations recognise that convertible debt is different from debt and equity, yet its basis of valuation is derived from these. The recommendations require an acceptance of the underlying theories, which in turn involve the subjective issues of discounted cash flows and the estimation of an interest rate for an equivalent straight debt. Through using these simple techniques, it is anticipated that the convertible debt shown on the balance sheet will have more correspondence with the condition of the debt than previous accounting treatments. At the same time these recommendations are consistent with earlier suggestions for showing the effect of the convertible debt in the profit and loss account.

References

APB (1966), *Opinion No. 10, Omnibus Opinion 1966*, American Institute of Certified Public Accountants, December.

APB (1967), *Opinion No. 12, Omnibus Opinion 1967*, American Institute of Certified Public Accountants, December.

APB (1969), *Opinion No. 14, Accounting for Convertible Debt and Debt Issued with Stock Purchase Warrants*, American Institute of Certified Public Accountants, March.

American Institute of Certified Public Accountants (1968), *Accounting Research Bulletin*, No. 43.

ASSC (1974), 'Earnings Per Share', *Statement of Standard Accounting Practice, No. 3*, CCAB Accountancy Bodies.

Bird, A. P. (1973), 'Convertibles', *Investment Analyst*, No. 36, pp. 14–32.

Brealey, R. A. and Hodges, S. D. (1972), 'The Valuation of British Convertibles', in G. P. Szego and K. Shell, editors, *Mathematical Methods in Investment and Finance*, North-Holland Publishing, Amsterdam, pp. 567–598.

Brigham, E. F. (1966), 'An Analysis of Convertible Debentures: Theory and Some Empirical Evidence', *Journal of Finance*, Vol. 21, pp. 35–54.

Davidson, S., Schindler, J. S., Stickney, C. P. and Weil, R. L. (1976), *Financial Accounting*, Holt, Rinehart and Winston, New York, pp. 316–320.

Dewing, A. S. (1941), *The Financial Policy of Corporations*, 4th Edition, Ronald Press, New York, p. 242.

Ford, A. (1969), 'Should Cost be Assigned to Conversion Value?', *Accounting Review*, pp. 818–822.

Handy, C. B. (1970), *The Accounting for Convertible Debt*, unpublished PhD thesis, Iowa State University, Ames, Iowa.

Harold, G. (1952), *Corporation Finance*, Barnes and Noble, New York, p. 71.

Imdieke, L. F. and Weygandt, J. J. (1969), 'Classification of Convertible Debt', *Accounting Review*, pp. 798–805.

Institute of Chartered Accountants in England and Wales (1987), *Accounting for Complex Capital Issues*, Technical Release 677, November.

McCullers, L. D. (1969), *Convertible Securities—Debt or Equity?*, unpublished PhD thesis, University of Florida.

Purdy, D. E. (1977a), 'Accounting for Convertible Debt', *Journal of Business Finance and Accounting*, Vol. 4, No. 1, pp. 99–114.

Purdy, D. E. (1977b), 'The Rationale of Convertible Debt', *Investment Analyst*, No. 47, pp. 24–33.

Purdy, D. E. (1981), *Accounting for Convertible Debt*, unpublished M.Sc (Econ.) thesis, University of Hull.

Rollins, M. (1909), *Convertible Securities*, Financial Publishing, New York, p. 3.

Savoie, L. M. (1968), 'Controversy Over Accounting Principles Board Opinions', *Journal of Accountancy*, January, pp. 37–41.

Skerratt, L. C. L. (1971), 'Convertible Loan Stocks 1958–1968: An Empirical Investigation', *Journal of Business Finance*, Vol. 3, No. 3, pp. 28–42.

Skerratt, L. C. L. (1974), 'The Price Determination of Convertible Loan Stock: A UK Model', *Journal of Business Finance and Accounting*, Vol. 1, No. 3, pp. 429–443.

Sparrow, J. (1969), 'Convertible Loan Stocks', *Journal of Business Finance*, Vol. 1, No. 1, pp. 24–28.

Weil, R. L., Segall, J. E. and Green, D. (1968), 'Premium Convertible Bonds', *Journal of Finance*, Vol. 23, pp. 445–463.

Appendix

The Calculations of the Annual Amortisation of the Discount

Debt base of £100

Year end	*Amortisation*	*Discount on Debt*	*Equivalent Straight Debt Value*
0		12.29	87.71
1	0.77	11.52	88.48
2	0.85	10.67	89.33
3	0.93	9.74	90.26
4	1.03	8.71	91.29
5	1.13	7.58	92.42
6	1.24	6.34	93.66
7	1.37	4.97	95.03
8	1.50	3.47	96.53
9	1.65	1.82	98.18
10	1.82	0	100.00
	£12.29		

Equity by base of £100

Year end	*Amortisation*	*Discount on Debt*	*Equity Basis*
0		17.63	82.37
1	1.06	16.57	83.43
2	1.18	15.39	84.61
3	1.29	14.10	85.90
4	1.45	12.65	87.35
5	1.59	11.06	88.94
6	1.78	9.28	90.72
7	1.97	7.31	92.69
8	2.18	5.13	94.87
9	2.43	2.70	97.30
10	2.70	0	100.00
	£17.63		

Year End Calculations

	Debt	*Equity*
Year 1		
Total	12.29	17.63
Deduct Amortisation	0.77	1.06
Discount outstanding	11.52	16.57
Year 2		
Deduct Amortisation	0.85	1.18
Discount outstanding	10.67	15.39
Year 3		
Deduct Amortisation	0.93	1.29
Discount outstanding	£9.74	£14.10

JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents
Volume 13, Number 1
May 1990

Editorial Data

Kyungho Kim and Douglas A. Schroeder
Analysts' Use of Managerial Bonus Incentives in Forecasting Earnings

Joshua Livnat and Paul Zarowin
The Incremental Information Content of Cash Flow Components

John R. M. Hand, Patricia J. Hughes and Stephan E. Sefcik
Insubstance Defeasances: Security Price Reactions and Motivations

Accounting and Business Research, Vol. 20, No. 79, pp. 253–267, 1990

The Reliability of Reported Profits and Asset Values, 1890–1914: Case Studies from the British Coal Industry

Judith Wale*

Abstract—Considering the vital importance of coal to the British economy before 1914, it is clear that accounting practices in the coal industry during the late nineteenth and early twentieth centuries have received too little attention. There is a particular need for studies comparable to the work on railways and iron and steel which has examined conventions for accounting for capital expenditure. Such conventions create serious difficulties in the interpretation of reported profits and asset values for historians of any industry and may also have misled contemporaries. Evidence for the coal industry which has been examined up till now has indicated that standard practice comprised a modified form of the replacement accounting used by railway companies. This paper examines the extent to which this supposition is justified. It concentrates on the accounting policies of five important colliery companies and on the effects of these policies on profits and the book values of fixed assets. Two principal conclusions have emerged. The first is that, although replacement accounting was certainly widespread, accounting policies were more complex and more diverse than has hitherto been suggested. The second is that it is frequently impossible for the historian to determine whether balance sheet values are indicative of capital employed. Both profits and asset values were in most cases highly unreliable.

Introduction

Surprisingly little research has yet been carried out into accounting practices in the British coal industry during the late nineteenth and early twentieth centuries and into the consequences of those practices. The gaps in our knowledge of the policies behind the recorded figures of profits and asset values are particularly serious in that coal was of such vital importance to the British economy in this period. Coal was then essentially the only source of fuel and in the peak year of 1913 the industry employed over 1.1 million men and produced 287 million tons of coal, almost a third of which was exported.

The accounting policies followed by colliery enterprises and the difficulties involved in interpreting colliery accounts are of course known in general terms, as will be shown in the next section. It has also long been clear that the extent of the profitability of the coal industry was a source of recurring debates before 1914, as one can see, for example, from articles in the *Colliery Guardian* newspaper. Published profit figures were viewed at the time as sufficiently uncertain and controversial to allow their use and reinterpretation in propaganda which was issued in support of a national minimum wage in the coal industry (Richardson and Walbank, 1911).[1] Furthermore, contemporary accountants published descriptions of best practice which included recommendations for improvements; examples are Lawn (1897), Monkhouse, Goddard & Co. (1905), Mann and Judd (1909) and Innes and Campbell (1913).[2]

On the other hand, it has not yet become clear how two or three hundred individual colliery enterprises, the number which were economically significant in this period, individually adapted general accounting conventions to suit the circumstances of their particular concerns. Most of these enterprises had developed into complex organisations with varying needs for accounting information. Statements in general terms conceal the variety of accounting practices actually followed. A further problem is that the work of contemporary accountants does not indicate how widespread current best practice was. The present author has attempted to fill a little of the gap in our knowledge of coal company accounting practices as part of an analysis of the overall development of a dozen colliery companies during the period 1880 to 1914 (Wale, 1987). Though conclusions are drawn to some extent from all the companies studied, the evidence is more substantial on five of the companies than on the rest. These five are examined individually in this paper: it is important to look at each concern on its own in view of the varying organisational structure and hence accounting requirements of each. An overview comparing accounting practices follows the individual studies.

---

*The author is lecturer in accounting at the University of Buckingham. She thanks the two anonymous referees for their comments on previous drafts of this paper.

[1] Walbank was an accountant. The issue is referred to by Church (1986, p. 520).

[2] The primary concern of these authors was the mechanics of colliery book-keeping, but many of their comments reveal the underlying assumptions that they made. On depreciation, for example, it is clear that the need for a consistent charge from year to year was not yet accepted by all leading firms of accountants, although the advocacy of fixed rates by such authorities as Matheson and Dicksee was not new in the late 1890s (Kitchen, 1974, pp. 115, 120). Monkhouse, Goddard & Co. (1905, pp. 32–3) defined a depreciation account as 'a continuous record of the sums transferred from profit and loss account to meet the gradual exhaustion of the coal seams and the general depreciation of the colliery properties and plant'. They also suggested the calculation of an annual average charge for depreciation. On the other hand, they also recommended that 'advantage should be taken of the larger profits in good years to set aside more than the usual charge so that the poor years may be relieved of a portion of this burden' (ibid.). By contrast, Lawn (1897, p. 110) stressed that 'the method of capriciously writing off for depreciation a lump sum one year and nothing during several other years is not to be recommended'.

Conclusions on profits and asset values in the coal industry are of necessity somewhat tentative. As all researchers on the coal industry have found, enormous as the total volume of surviving evidence on the industry is, there are almost always serious gaps when one comes to look at a particular set of records, such as those of an individual company. One must also of course take care to view the accounting practices of the period on their own terms and in their proper context. One must avoid assuming that practices of an earlier date were inevitably primitive and inferior to present day policies. Nevertheless, it is clear that accounting conventions in the coal industry, concerning the twin questions of capitalisation of expenditure and depreciation, rendered accounts sub-optimal from the point of view of users as regards the matching of revenue and expenditure; a secondary effect was lack of consistency over time and of comparability between enterprises.[3] Reported profitability, of interest to both historians and contemporary owners and managers, in most years differed significantly from the profit figure which would have been arrived at had there not been a 'failure to systematically distinguish between capital and revenue expenditure and . . . [a] failure to periodically allocate the original cost of fixed assets to expense' (Brief, 1965, p. 14). Profit figures were unreliable in the sense that they could have misled those attempting to interpret them. In consequence owners and managers could have arrived at inappropriate decisions regarding both the short and the long term future of their concerns. One cannot however clearly determine the extent to which business leaders in the coal industry were in practice misled. This is partly because, for lack of evidence, one cannot gauge the extent to which their assessment of their company's progress was based on information other than the reported figures of profits. As regards reported balance sheet values, these are perhaps less important as regards contemporaries, who did not treat the balance sheet as a valuation document for the business as a whole, although they could still have been misled as to individual asset values. Reported balance sheet values particularly require elucidation because historians (with important exceptions)[4] appear to have taken them at face value when discussing the net amount of capital employed in coal and other industries, as well as to have been insufficiently critical of reported profits.

One feature of profits in the coal industry in the pre-1914 era must be emphasised before we move on to take a general view of colliery accounting practices, followed by the examination of individual companies. Profits from coal fluctuated enormously over a short cycle as selling prices moved rapidly up and down; the environment was one of almost perfect competition between enterprises. The effect on profits of changes in costs and productivity was always outweighed by the effect of changes in income from coal. Apart from 1890, virtually every year between 1880 and 1897 witnessed low profits. There was then a violent upswing to an enormous boom in 1900, which was however followed by years of fairly low profits until the boom of 1907–08. No subsequent year was particularly good for profits until 1913; the boom was itself at an end before the outbreak of World War I.

The distinction between capital and revenue: collieries, iron and steel and railways

Problems of accounting error and inconsistency, particularly the failure to distinguish between capital and revenue, have already been touched on by some writers on the coal industry. The difficulties in establishing the distinction between capital and revenue were far from new in the late nineteenth century. Flinn has revealed, for example, that in the eighteenth century there was as regards costs:

---

[3] It would be interesting in a few cases, where records allow, to reconstruct the flow of cash receipts and payments, so as to create a picture of the progress of a colliery enterprise which was free from the somewhat arbitrary allocations of accounting conventions. On the other hand, it may be more appropriate to extend to accounts of an earlier period the recent justification of the use of accounting rates of return in assessing an enterprise's performance (Edwards *et al.* (1987), pp. 5–6). The justification is more convincing for results over a long period, over which short term distortions will tend to cancel out (Kay, 1976, p. 459). Long term trends are of more interest in the development of companies in the 1890–1914 as well as later periods.

[4] Exceptions include Mitchell (1984, pp. 40–1) and Church (1986, p. 99).

> a grey area in the labour costs of preparatory underground work. The extension of existing levels and the opening of new bords were, it seems, normally entered as current production costs, while the creation and equipment of new levels, the deepening of existing shafts, or the sinking of new ventilation or winding shafts were 'extraordinary' expenses [which were not seen as a charge against annual profits] (Flinn, 1984, p. 286).

The case studies presented here show that the cost of the former type of work, the driving of new underground roadways and the opening up of fresh working places, was still normally charged entirely against the profits of the year in which it was incurred, even though the benefits of such development work might be felt for several years.

The standard practice in the nineteenth and early twentieth centuries for accounting for the sinking and development of a new pit by a company has been neatly set out by Taylor:

> In broad terms the convention was to charge to the capital account all those items of expenditure which were necessary to bring a colliery into full commission and to close the account when the colliery was 'sufficiently developed to produce its recouping quantity of coals' (*Colliery Guardian*, 2 November 1871). Within the capital account, therefore, would be included charges—both in relation to materials and to labour—for the provision of shafts and their equipment, winding gear, engines, ventilation machinery, underground working stock (including horses and ponies) and surface equipment. In addition, in the north-east at least, it was customary to include the cost of providing houses for the work-force and 'everything requisite for putting [the coal] on board the craft [in the river]' (PP [HL], 1830, vol. VIII, p. 31). This would involve payment for varying lengths of private railway line and for the staithes from which the coal was loaded on to sea-going ships (Taylor, 1980, pp. 55–6).

An example of how accounting practice for a new enterprise had developed by the first decade of this century is given in Section 6.2 below. It is important to emphasise that, once a pit became fully operational, no expenditure at all was normally added to the 'capital' account figure in the balance sheet; in other words, the gross fixed asset total was unchanged from year to year. (This represents a modification of the replacement accounting used in railway companies, where additional capacity as opposed to replacement assets might well be capitalised: Brief, 1965, p. 15.) The possibility of accounting error resulting from such a policy was recognised by Pollard for the coal industry for the period prior to 1830 (Pollard, 1972, pp. 134–6, 143–4). He seemed uncertain, however, as to whether such accounting error had serious consequences, because of the likelihood that errors frequently cancelled out (ibid., pp. 138–9). Church, on the other hand, believes that for the later nineteenth century there may have been serious accounting error.[5] Moreover, he considers that these accounting conventions created error in a particular direction, that of understating annual profits. As we shall see, this is the direction of error indicated by the case studies. In the course of his discussion of the likely actual size of annual profits, Church points out that:

> To the extent that the working-cost account does include some items of capital funding over and above that of mere depreciation, retained profit figures must be regarded as minimum values and underestimate the actual amount of profit ploughed back into capital development, (Church, 1986, pp. 146–7).[6]

The iron and steel industry has hitherto come under more scrutiny than the coal industry as regards accounting practices. What has been revealed is particularly interesting in the context here, since many of the companies examined (Edwards, 1981, p. 7) operated substantial collieries in addition to making iron and steel. Not only was there considerable diversity in capital accounting practices, ranging from various methods of depreciation, to different types of renewal accounting (ibid., pp. 22–4), to the policy of the Dowlais Iron Company, where 'items of capital expenditure normally appeared in the profit and loss account ... as a cost for the year in which the expenditure was incurred' (Edwards and Baber, 1979, p. 142). There was also a marked tendency, which appears too in the companies examined in this paper, for companies to diverge in a particular year or certain periods of years from the main policy followed in the long term. A good example is provided by the Staffordshire-based Shelton Iron, Steel and Coal Co. Ltd (Edwards, 1980, p. 253). This second point is one of the factors leading Edwards and his co-authors towards the conclusion that accounting policies tended to be chosen not because those in charge of companies were ignorant of methods which might have been more appropriate for their needs, but rather because of owners' and managers' perceptions of the attitudes of the consumers of accounting information. In other words, 'management will choose methods for measuring profit and reporting business activity which are conducive to the achievement of its objectives' (Edwards and Webb, 1982, p. 259).

---

[5] It is not clear whether the following is an extreme example, but as much as £70,000 spent by the Staveley company on sinking additional pits was not capitalised; this was during the years up to 1874, two of which (1872–3) saw exceptionally high profits (Chapman, 1981, p. 81).

[6] Church implies that many firms deliberately retained a considerable fraction of profits so as to finance expansion (ibid.).

Problems of accounting error and inconsistency have been examined in relation to one further type of enterprise which was highly capital intensive by the standards of the nineteenth century: railway construction and operation. Chandler has shown that the accounting conventions employed by the large American railroad companies (Chandler, 1977, p. 112) were similar to those employed by the British coal industry. He has made clear the consequences of these conventions for assessments of the performance of any enterprise, whether by management at the time or by historians:

> The method of renewal accounting [used by the railroad companies] meant that the profit would continue to be considered as the difference between operating income and expenses but not as the rate of return on investment in actual capital assets. The use of renewal accounting made it impossible to know how much capital had been invested in roadbed, plant and equipment since so much of the cost of capital equipment had been absorbed as operating expense... This method of defining depreciation also meant that American railroad accounting overstated operating costs and understated capital consumption (ibid., p. 115).

Like Chandler, Brief has stressed the significance of renewal (or replacement) accounting in the accounting practices of American railways (Brief, 1965, pp. 14–15, 21, 23, 25). He seems rather keen however to play down the strength of evidence which indicates that replacement accounting concerning railways and other types of enterprise tended to lead in the direction of reported profits which were too low (ibid., pp. 30–1). Edwards has found that British railway enterprises also normally used replacement accounting (Edwards (1986), p. 255). He too concentrates on aspects of railway accounting which would have tended to overstate profits, especially the failure to charge depreciation (ibid., p. 260). The tendency in the coal industry which (as noted above) my case studies reveal is, however, for profits to be understated. It seems at first surprising that two capital intensive industries, within which large and complex enterprises developed at about the same time, should show divergent trends as regards the consequences of accounting practices and accounting error. This divergence may however be due partly to the fact that the evidence presented here covers the period after 1890, whereas the railway evidence belongs largely to the mid-nineteenth century. Taylor (1986, pp. 101–2) suggests that excessive capitalisation of expenditure, leading to overstated profits, was less prevalent by 1913. A further reason for the divergence of accounting practices may be the fact that, in contrast to railway company shareholdings, the majority of shares in all five companies studied here were (to a varying extent) held by a closely associated group of business leaders.

In the following five sections we now examine the detailed evidence for the understatement of profits. This question is linked as far as possible with the closely related problem of the reported balance sheet value of the enterprise and the appropriateness of that value. The differences in length and detail between the case studies have been largely dictated by the nature of the evidence; the problem of gaps in the evidence has already been noted.

The Cramlington Coal Company Limited, Northumberland

Introduction

The Cramlington Coal Company was one of the larger and more complex colliery enterprises of the period 1890–1914. It not only employed in its seven pits nearly 3,000 men and provided over 1,000 houses for them, but also operated a railway which linked the pits with the River Tyne. Cramlington was by 1890 a mature enterprise where, despite a desire to keep output as high as possible, the aim of the owners was fundamentally maintenance of the existing scale of operations rather than rapid growth. Capital investment was therefore a matter of replacement and renewal and the development of new seams and districts with existing pits, rather than a series of large new projects. This is not to say that expenditure of a capital nature was small or unimportant. On the contrary, not only did many of the assets replaced have a long life, but also the new assets normally incorporated technological improvements. In addition the company acquired some completely new types of asset during the last ten years before 1914, including electrical transmission plant and mechanical coalcutters. Profits, when averaged over a number of years, were at a satisfactory level until the last few years before 1914; a small loss was made in 1911. The average annual profit during the years 1898 to 1908, for example, was £68,000. This description of the company should give some idea of the context in which accounting practices regarding capital expenditure, depreciation, and the valuation of the company as a whole, were carried on.[7]

---

[7] The overall development of the company is discussed in Wale (1989b).

The company was owned by four families who, like most coal owners, held interests in a number of colliery companies or in other types of enterprise with the aim of spreading risk. The senior manager provided the link between the owners, who made up the board of directors and who were interested principally in the overall long term progress of the company, and the hierarchy of lower management based at the pits, who were responsible for the day to day running of the pits. Between 1893 and 1914 the post of senior manager was held by John Morison, who appears to have been the key figure in the development of the company in this period on account of his influence over the board. A qualified mining and civil engineer, he displayed in his reports to the directors considerable knowledge of accounting procedures, together with an awareness of at least some of the implications of the practices which were being followed. His own financial responsibilities were however restricted to interpretation of cost accounts prepared internally, a function which was, it seems, frequently carried out by engineers in this period (Parker, 1980, pp. 265–6). The final annual accounts were prepared externally by the company's auditors, Holmes, Spence & Co. of Newcastle.

Asset Replacement and Depreciation

We have evidence only for the years after 1897, but modified replacement accounting was then practised to a considerable extent. The practice involved writing off in the 'materials' account of the profit and loss account the entire cost of items which were not expenses relating to the given year alone, but which would on the contrary be in use for several years ahead. Morison did at least realise that the profit figures ought to be interpreted with the effect of these items in mind. He appears also to have had a partial grasp of the concept that such expenditure was of a capital nature. He reported to the directors, for example, in respect of the boom years of 1907 and 1908 that:

> In my last year's report [for 1907] I referred to the cost of consumable stores and picked out from the Materials Account items which I considered increased the value of the Colliery, in respect that they were substantial repairs, to the extent of £10,298. In the current year's accounts I can pick out similar items which amount to £1,512/16/6 and, in addition, £2,006/11/5 has been expended on the locomotives (NRO/1274/38, p. 3).

In depressed years profits tended to be understated less than in boom years; there was less spare cash available for capital equipment in such years. Even in the depressed year of 1911, however, the 'materials' account was overstated since, as Morison pointed out:

> During the year £1,163/11/2 was spent on coalcutters and accessories, £1,043/18/4 on Rolled Steel Joists, and £775 for a new boiler for No. 7 locomotive. All these have been included in the costs (NRO/1274/8, p. 3).

In 1915 it appears that about £11,000 of the total materials account charge in the profit and loss account of £66,851 related to capital equipment or improvements, such as coalcutters and conveyors, tubs, pumps and haulage gear (NRO/1274/15, pp. 4–5). It is clear that modified replacement accounting meant failure to capitalise new types of assets reflecting technological change as well as the renewal of worn-out equipment.

The process just described meant that many assets never reached the balance sheet. Modified replacement accounting was however not the only accounting policy applied to the purchase or creation of assets. Temporary capitalisation followed by write-off against revenue reserves was an alternative practice. Unlike the form of replacement accounting just described, it did not reduce the reported profit for the year. Write-offs were, not surprisingly, more likely to occur during a boom. Between 1899 and 1901, for example, £44,000 which had been spent during the previous few years on capital works, both labour and equipment, was written off against revenue reserves (NRO/1274/34, 35).

The third way in which retained profits were reduced by writing off assets was through depreciation itself. It appears that for some types of asset an annual depreciation charge was a well established procedure: amounts were charged each year on the fittings of the company-owned public house and on farm implements (NRO/1274/15, p. 10). These amounts were however very small. Otherwise depreciation was not consistently applied to the collieries: after a provision in each of the years 1898 and 1899 (NRO/1274/36) there was no depreciation charge until after electrification of the pits had taken place in 1911. By 1914, on the other hand, £2,867 per annum was being charged against profits (and included in the materials account) for 'electric plant redemption' (NRO/1274/15, p. 4).

Was the Company Overvalued?

The appropriateness or otherwise of these policies regarding asset write-offs and depreciation can only be properly assessed following an examination of the total balance sheet net assets and an assessment of how fair a view of the real value of the enterprise the balance sheet values gave.[8] The

---

[8] As already noted, appropriateness of balance sheet values is defined principally in relation to the treatment of such data by some historians.

Cramlington enterprise became a limited liability company in 1887, at which time share capital of £252,000 was issued fully paid. It appears that the value of the fixed assets represented the incorporation into the accounts of a professional valuation of the company. By 1900 this valuation was out of date for a number of reasons. A modernisation programme had significantly reduced operating costs, so that the potential profitability of the company was enhanced (NRO/1274/57/1). Moreover, major additions to capital had taken place since the valuation but none of these appears to have been capitalised; they included the sinking of a small new pit, the purchase of another pit and the replacement of equipment.

The balance sheet for 1900 shows total fixed assets of £226,311 (NRO/1274/34). Apart from £20,611 separately disclosed as freehold land and the colliery houses built on it, there is only a single figure, £205,700 exactly, which is described as the colliery and its equipment. A fresh valuation was carried out by consulting mining engineers in 1900 (NRO/1274/3). The effect of this valuation on the 1901 balance sheet was to add £252,000 to the colliery and equipment figure, making the total for fixed assets £478,311. By 1914 this total had climbed in stages to £554,344, the largest annual increases occurring between 1911 and 1913 (PRO/BT31/16655/70425). This extra £76,000 represented the capitalisation of actual expenditure. It shows that the company did not always follow the practice of capitalising only new pit sinkings. The expenditure capitalised included the electrification of the pits from 1911 onwards and probably also a coal washing plant.

The reconstruction of the Cramlington Coal Company Ltd. in 1901, which entailed a doubling of issued share capital from £252,000 to £504,000 without the injection of any cash, can be seen as the direct consequence of the revaluation of the company's assets in 1900. One must attempt to determine how appropriate both the valuation (£420,667) and the book value of the assets (£478,311) were in relation to both the current state and the future development and prospects of the company.[9] The valuation was derived from the earning capacity of the assets.[10] One of the company's directors not only performed various calculations to determine what assumptions had been made by the valuers, but also recorded the following notes on standard practice in colliery valuations in the period:

> It is usual in valuing mineral properties to estimate the resources, affix from that information a life to the property at the supposed rate of output, and then after estimating the supposed average profit to treat the same as an annuity payable for the years which it is estimated the property will work; the rate of interest allowed to a supposed purchaser being fixed in accordance with the risk. This capitalised profit usually forms the chief value. In addition the plant is valued and a sum fixed which it would be supposed to bring at the end of the life of the colliery (NRO/1274/57/1).

This director worked out that the valuers had assumed annual profits of £45,000. The selection of an appropriate level of profits to discount was particularly crucial in the coal industry where profits fluctuated wildly. Since the 1900 valuation was made at the peak of an enormous boom, one might have expected that assumptions about profits would be somewhat over-optimistic. It appears however that fluctuations in selling prices were adequately taken into account and that the several poor years in the 1890s had not been forgotten. Actual profits for the period 1898 to 1908 averaged, as already noted, some £68,000. This was a level 50 per cent higher than that projected by the valuation. If reported profits were too low, the likelihood of overvaluation is further reduced. It appears therefore that during the first decade of this century the company was not overvalued.

It is probably also true, however, that a revaluation was due in 1914. By this time it should have become clear to the directors that the boom of 1913 had not wiped out the problems of the previous five years: low profits and a marked rise in unit operating costs. It is not surprising that no revaluation occurred, since it was believed that measures to counter low profits would reverse the trend within a year or two. A further indicator of overvaluation by 1914 lies in a tentative suggestion by senior manager Morison to the directors in 1913:

> In viewing the property of the Cramlington Coal Co. and having regard to the general conditions and especially to the exhaustion of the more cheaply worked seams, a rearrangement of finance which would permit of provision for the redemption of capital within a given period would be very desirable... [The company has] a considerable amount of capital involved which is to a very large extent represented by Goodwill, and in the event of the output diminishing from any cause... it might be found that the provision made at present for redemption was quite inadequate (NRO/1274/10, pp. 3–4).

---

[9] It seems reasonable to assume that the 14 per cent difference between the valuation and the book value arose from the administrative convenience of doubling the share capital.

[10] Earning capacity as a basis for the valuation of capital employed appears to have been in use in Northumberland for over eighty years by the time that this particular valuation was carried out (Edwards, 1989, pp. 88–9).

His criticism of the failure to begin charging depreciation on the main fixed asset figure in the balance sheet (the £478,311) perhaps means that one should take a less critical view of the heavy write-offs to the materials account which were noted in the previous section. In a sense the two policies cancelled each other out. On the other hand, the most appropriate judgement seems to be that, though in individual years profits were understated, in the long run the stated value of the enterprise as a whole was becoming too high.[11]

Broomhill Collieries Limited, Northumberland

Introduction

Broomhill Collieries Ltd shared a number of features with the Cramlington company, especially after about 1908 when the two enterprises were similar in size and had ceased to grow. At Broomhill too, capital investment came to involve mainly the replacement of assets, although electrification was undertaken and asset renewals incorporated technological improvements. Both companies suffered a decline in long term profitability during the last few years before 1914. Like Cramlington, Broomhill had as its auditors the firm of Holmes, Spence & Co. One can also identify significant differences between the two concerns. Broomhill Collieries Ltd was created only in 1900, by means of the amalgamation of two neighbouring companies. Moreover, though the directors and associates of the old companies retained a controlling interest in the new, there was now a substantial minority providing capital from outside. This new capital allowed the company to grow rapidly for a few years until 1908. The company was quoted on the Newcastle-upon-Tyne Stock Exchange and by 1914 the total number of shareholders exceeded 700, though most of these holdings were very small (PRO/BT31/36617/67635). This meant that its annual accounts were much more widely distributed and its accounting policies perhaps more critical than was the case with the Cramlington company.

Asset Replacement and Depreciation

Modified replacement accounting was explicitly employed in Broomhill's financial statements. In this company however it was used in addition to rather than in place of depreciation. Sizeable items of capital equipment were written off against profits in the year of purchase. The items included plant with many years of life, such as a new ship's boiler, a brickworks boiler and tubs for underground haulage. The comment made in the auditors' report for the year ended 30 June 1902 is similar to statements in other years: 'All renewals of Colliery Plant, together with a large portion of the expenditure on new Plant and on Improvements, have been charged to Revenue' (NRO/NCB/BR/box 22). This policy was not so extreme as to mean that nothing had been capitalised since the pits were new. It still however makes it likely that the fairest profit figure would have been at least a few thousand pounds higher each year than the figure reported to shareholders. The distortion was probably greater in boom years, when more funds were available for replacing and adding to equipment.

There was no failure to charge depreciation at Broomhill. On the contrary, company policy over depreciation became noticeably cautious, especially after the performance of the enterprise began to deteriorate. The amount of depreciation appears particularly large in view of the fact, noted above, that much capital expenditure was never capitalised at all. Some of the depreciation was not initially designated as such, the amounts charged against profits being used to create a reserve fund and a sinking fund; the need to create a fund for the repayment of debentures was a priority for the company. After some years, however, most of these balance sheet reserves were cancelled through the deduction of an equal amount from fixed assets, this move being described as depreciation (NCB/BR/box 22). The amount of the depreciation charge against profits, apart from the sinking fund portion, was not consistent from year to year. It reached £55,000 in 1913, about £48,000 in both 1907 and 1908 and £30,000 in 1912, but was mostly only about £12,000 and was virtually non-existent in 1911, the poorest year as regards profits. This inconsistency meant that profits in individual boom years were understated relative to profits in depressed years, even if the average depreciation rate was appropriate. Such a policy of 'income smoothing' was of course rational from the point of view of pleasing the company's several hundred shareholders.

Was the Company Overvalued?

The effect of the depreciation on recorded asset values was that the fixed asset total was at virtually the same level (about £550,000) in 1912 as it had been in 1901, though in the meantime the concern had grown considerably in size and possessed much newish capital equipment, and though £240,000 relating to freehold land and equipment had been capitalised (NCB/BR/box 22). Two years later in 1914 the balance sheet value of the assets had dropped to £480,000 (BT31/36617/67635).

---

[11] Gaps in the evidence prevent more in the way of numerical proof of the understatement of profits year by year. The drastic change of circumstances for all colliery companies after 1914 of course means that one cannot fully analyse trends in a long term perspective after about 1908.

The initial figure of £550,000 in 1901 had been displayed in the prospectus for the new company; it represented a valuation of the two previous companies which was based on their property and estimates of future earning capacity. Mitchell believes that Broomhill Collieries Ltd is a 'good example [of] the establishment of asset and liability entries that were both "too high" [as] the result of valuing an existing colliery excessively when its ownership was transferred during a boom period'. He estimates that Broomhill's assets were overvalued by 'approximately a quarter' (Mitchell, 1984, p. 309). Even this estimate appears too precise in the circumstances. There is certainly plausible evidence that the directors eventually came to accept that the company had been overvalued initially. The large depreciation charges, together with the marked fall in the balance sheet value of fixed assets relative to the physical assets of the company by 1914, become more comprehensible when seen as measures to remedy overvaluation. It is however impossible to say conclusively that the company was initially overvalued.

Mitchell's belief that 'boom-time euphoria' was the main cause of overvaluation is more open to question (ibid., p. 309). A significant proportion of the valuation was no doubt based on expected future profits. The influence of the extraordinarily high prices of 1900 most probably raised expectations of future profits to some extent. On the other hand, contemporaries were accustomed to large swings in coal selling prices and would have realised that a sharp fall from 1900 levels would soon occur. It seems most likely that, as at Cramlington in the same year, only a moderate average level of selling prices was incorporated into the prediction of future profits. It is thus unlikely that the company was significantly overvalued in 1900 because of unrealistic expectations about movements in the trade cycle. If there was overvaluation, its source was most probably over-optimism about the long term growth in scale of the enterprise. Such over-optimism would have led to overestimates of future profits that were flawed as regards both the expected size of output and the expected rate of profit per ton of output. Geological problems prevented the increase of output to a level where the very heavy total fixed overheads (a feature of all colliery companies) ceased to be serious in terms of fixed overhead per ton mined.

Londonderry Collieries Limited, Durham

Introduction

Londonderry Collieries Ltd was established in order to take over the management of the pits owned by the Marquis of Londonderry, to whom virtually all of the £550,000 share capital was issued fully paid (MYB; DRO/D/Lo/B/A). The company was created in 1899, just a year before the Broomhill company. At this date it was a similar enterprise to Broomhill, in that there were two large pits (Seaham and Silksworth) which were no longer being rapidly extended and where investment was largely a matter of replacement. On the other hand, the Londonderry enterprise developed a new large pit (Dawdon) between 1903 and 1908. This pit was a great success by 1913, with high productivity, though the capital requirements to complete the sinking process had been very heavy. Though profit per ton was not enormously high in most years, the Londonderry company was substantially more profitable than either Cramlington or Broomhill, thanks to the success of Dawdon pit. The Londonderry concern was also much larger than the other companies studied here, having 7,500 employees by 1913. The overall direction of the company was in the hands of two of the directors, who were respectively the sales agent and the production manager. The company was audited by Deloitte, Dever and Griffiths from 1903 onwards; their brief extended at least on their initial engagement to the audit of the book-keeping systems and recommendations for improvements in internal control and clerical effort were made (D/Lo/B/219).

Depreciation and Profits

The reported profits of Londonderry Collieries Ltd are likely to have been understatements of the most reasonable figures for excess of income over operating expenses. In this more successful company it was admittedly deliberate policy not to charge depreciation. The audit report for 1908, like those for several later years, stated that, in arriving at the profit figure, 'no specific provision has been made in the accounts of the company for loss of capital which will arise when the pits are ultimately closed' (D/Lo/B/219). To the extent that depreciation should have been charged, profits were overstated. It is however likely that the appropriate rate of depreciation on Dawdon pit would have been a very low one, since it was new and had a long expected life.

The following evidence suggests that depreciation not charged was probably far smaller than the understatement of profits arising from modified replacement accounting; that is, from the writing off against profits of new equipment and development work which provided a return over many future years. The company followed over Dawdon the traditional policy of capitalising all expenditure on a new pit until a certain precise date when the pit was deemed fully operational. After this date (January 1908) there was no capitalisation of further development work or additions to plant, though expenditure on both was substantial. The single figure for the capitalisation of Seaham and Silksworth pits, moreover, remained unchanged from the figure entered in the accounts when the limited company was created in 1899. Audit reports further stated that 'profit is arrived at after providing for ordinary wear and tear to the extent of repairs and replacements and after charging expenditure on new work at Seaham and Silksworth' (ibid.). The first half of this statement undoubtedly represents a fair policy from the point of view of matching revenue and expenditure. The second half, on the other hand, leads one to believe that many items which should have been capitalised and then systematically depreciated found their way into the profit and loss account in the year that the work was carried out. Even if the aim was to maintain productive capacity rather than increase it, that maintenance no doubt incorporated many piecemeal technological improvements which were not straightforward replacements of worn-out assets.

Charging capital expenditure to revenue did not, however, arise solely from the advice of accountants. The two eminent mining engineers who valued the company in 1898 commented then that Silksworth pit was fully developed and that the aim was to maintain rather than increase output. This being so, they stated, 'no further capital [is] required for its future working beyond such as may be fairly set against revenue' (D/Lo/B/219). It is true that expenditure on new work, including electrification, at Seaham and Silksworth in 1913 and 1914, amounting to nearly £70,000, was temporarily capitalised. The company's auditors recommended, however, that, as soon as the work was completed in 1915, the whole amount should be written off against profits over only three to five years (D/Lo/B/219). This was probably an inappropriately short period; technological progress in electricity supply was not so rapid as to render a system obsolete within a few years.

Was the Company Overvalued?

The balance sheet figure in 1914 for Dawdon pit (around £300,000) appears to be a reasonable reflection of the value of the pit. The figure represented actual costs recently incurred. The failure to add capital items after 1908 was partly compensated for by the failure to charge depreciation. £300,000 was in any case a large figure for capital expenditure for the period without any further additions. The profitability of the pit meant, on the other hand, that any valuation based on earning potential would have produced a large figure.

The book value of Seaham and Silksworth pits is not so straightforward to interpret; the difficulties involved are similar to those encountered with Cramlington and Broomhill. The balance sheets showed an unchanging figure of £516,583 from the formation of the company in 1899 down to 1914 (D/Lo/B/A). This represented the valuation of the pits at Seaham and Silksworth, together with movable plant and housing. The figure should be compared with the professional valuation of February 1898 carried out by consulting engineers, who discounted the expected 'average annual profit' from each pit at 15 per cent (the percentage used at Cramlington). They took into account the potential effects on the profits of each pit of the sinking of a new large pit. The valuation figure was only £314,000; even though one must add a substantial sum for the houses, the valuation figure is at least £100,000 lower than the balance sheet figure. It seems that the company's directors raised their expectations of future profits during the eighteen months which elapsed between the valuation and the formation of the limited company, months which saw an explosion in selling prices. In this case too, however, it appears that the boom did not necessarily create an over-optimistic valuation, since even the fairly depressed years of 1902 to 1905 produced annual profits which were about double the amounts assumed in the valuation.

As in the case of Cramlington, on the other hand, it is arguable that during the last few years before 1914 the book value of old pits became too high. Those years saw a marked fall in the profitability of Seaham and Silksworth, the company becoming very reliant on Dawdon for its large total profits. From this point of view the write-offs of 'new work' and the only temporary capitalisations at Seaham and Silksworth seem much less inappropriate. Though these practices were certainly not optimal, their effect was to compensate for any failure to make an explicit depreciation charge for these pits.

Horden Collieries Limited, Durham

Introduction

Horden Collieries Ltd can be distinguished from the other companies discussed here in that it was created to develop pits in a previously unexploited area of the Durham coalfield. It was thus the only one of the five to have no pits of considerable age. The company was floated on the Newcastle Stock Exchange in 1900 and by 1914 over a million pounds had been raised (DRO/NCB4/15, pp. 3–261; SEOI). Two pits (Shotton and Horden) were begun almost immediately; they became fully operational in 1904 and 1906 respectively. Sinking of a third (Blackhall) commenced in 1909 and production began there in 1913, but at the outbreak of World War I the extension of this pit to its planned rate of output was still incomplete, though by 1913 the company employed nearly 5,000 men (List of Mines). The volume of new capital investment by the company was thus very large and was still continuing in 1914. By that date the volume of replacement investment was also becoming significant. From 1907 substantial profits were made and by 1913, if one compares whole companies rather than individual pits, the

Horden enterprise was more profitable than that of Lord Londonderry. Though Horden was a public company, control rested, as in the cases of Cramlington and Broomhill, with just a few prominent north-eastern families.

Capital Expenditure, Depreciation and Profits

The records of Horden Collieries Ltd conform to the standard practice of accounting for the development of a new pit and the transfer from the development stage to full production and operation as a trading concern (see above). At a certain precise date the process of sinking and opening out a new pit was deemed to be complete. This date occurred some considerable time after the first saleable coal had been won, both because some coal was inevitably extracted in the course of driving underground roadways and because development was not considered to be complete until the intended long term output level of the new pit was about to be reached. Prior to the completion of development, all expenditure was capitalised and any revenue received from the sale of coal was deducted from the cost of the capital investment.

At Horden Collieries the development phase of Shotton pit was deemed to be compete on 1 January 1904 (NCB4/15, p. 45) and that of Horden pit on 1 July 1906 (ibid., pp. 83, 102). In the year ended 30 September 1914 Blackhall pit was still in its development phase (ibid., p. 261). The gross capital cost of the development of the three pits down to 1914 was £1.92 million. It is misleading to look at the net capital cost as a measure of the investment because of the substantial revenue generated by the sale of coal which was deducted from the gross cost before development ended: nearly £120,000 for Shotton and Horden between 1902 and 1906 (ibid., pp. 15, 29, 45, 65, 83) and £30,000 at Blackhall in 1913–14 (ibid., pp. 239, 261). Only to a small extent in comparison can the gross cost of development have been overstated by the inclusion of indirect costs of running the enterprise in its first years; office expenses are an example of such costs. The treatment of coal sales also obscures the fact that the company was making some profit before 1907 and that profit was greater than the figures reported in 1913–14.

Though Horden Collieries followed the standard method of accounting for the initial development costs of a new pit, replacement accounting was not the policy followed after operations had begun. The company did not write off against the profit for the year all additions to capital investment made after the pits had opened. Instead it followed a policy which was more appropriate as regards the separation of capital expenditure from revenue expenditure: that of continuing to capitalise development work and new equipment at Horden and Shotton pits and of charging depreciation on the collieries each year. The depreciation charge against the profit for the year was, as a proportion of the original outlay on the assets, relatively even. Extra depreciation was in some years deducted straight from reserves without affecting reported profit, though the reduction in reserves could conceivably have tended to lower the dividend paid (if shareholders perceived that reduced reserves should imply reduced funds available for paying dividends). (The company did, moreover, take the precaution of building up a separate 'reserve account', which reached £50,000 by 1914 (NCB4/15, p. 261.) Out of a total capitalised cost of £970,000 for Horden and Shotton pits and the coke ovens, £337,000 (nearly 35 per cent) was spent after June 1906 when Horden pit was deemed fully operational (NCB4/15, pp. 3–261). By 1914 accumulated depreciation of the collieries, which had begun in 1907, amounted to nearly £85,000, of which £58,000 had been deducted from the profit for the year and the balance from revenue reserves (ibid., pp. 102–261).

The result was probably a much fairer statement of profits as a measure of the company's performance than the accounts which emerged from most colliery companies. The improvement arose from the absence of a large understatement of profits caused by sizeable immediate write-offs of capital expenditure.

The Griff Colliery Company Limited, Warwickshire

Introduction

The creation of the Griff Colliery Company in 1882 resulted from the purchase of two pits by two of Britain's leading coal owners (R. Knowles and E. Bainbridge), who aimed to increase the size and profitability of the pits through further investment. Between 1892 and 1894 the rate of capital investment was substantially higher than previously as a third pit (Clara) was sunk. In 1898 the 'old' company was technically liquidated and a 'new' company with a much higher valuation was created. Output of coal grew rapidly until about 1902, but only slowly thereafter, and investment came to consist of the development of new areas of the two remaining pits (No. 4 and Clara), accompanied by the piecemeal modernisation of equipment. This company is the smallest of the five studied here, but it was not a small colliery company by the standards of the day, and by 1912 the number of employees exceeded 1,800 (CR1169/22). Profits were generally at a satisfactory level and were a little better than those at Cramlington (Figure 1). Griff also suffered a smaller decline in profitability in the period 1910–14. The annual reports of the senior manager, E. F. Melly, together with the minutes of board meetings, provide our evidence of the company's accounting practices and of the relationship between those practices and the pattern of investment.[12]

It should also be noted that the owners of this company thought in terms of return on capital. Their concept involved, however, not the relationship between annual profit and current balance sheet values, but instead that between dividend paid and the original paid up capital of the company (£20,000) which represented the cash they had subscribed. Even after balance sheet values were changed in 1898, the denominator in the calculation was still £20,000.

Depreciation, Asset Replacement and Profits

There was no failure to charge depreciation at the Griff company: charges were already a feature of accounting policy by 1890. Prior to the revaluation of the company in 1898 (see next section), £4,000 depreciation had been provided for the new Clara pit, as well as £9,000 for the older pits (CR1169/22). A fund for the repayment of debentures was also created before 1898, in which year the balance sheet of the company was totally altered and the existing provisions and reserves wiped out. During the boom of 1899–1901, £21,000 was transferred out of profits; the aim was originally to provide for the repayment of debentures, but shortly afterwards the £21,000 was deemed to be depreciation (CR1169/22). It was then deducted in the balance sheet from the colliery valuation figure, partly as a result of recommendations from the company's auditors to build up a depreciation charge. From 1911 there was an annual depreciation charge of £5,000, comprising a reduction of £3,000 on the colliery valuation (see next section) and £2,000 on the value of investments (CR1169/22). The £3,000 was probably at the right level, though the £2,000 was insufficient, since most of the 'investments' represented £25,000 of worthless shares in a neighbouring colliery, which the Griff company had been compelled to buy.[13] 1901 also saw the creation of a general reserve fund of £15,000; in the boom of 1908 this was increased to £25,000 (ibid.). The repayment of debentures was probably one of the aims of this fund (assuming that the directors viewed the transfer from annual profit as a signal to reduce cash withdrawn through lower dividends).

The method of depreciation and reserve creation should be criticised because it was not a consistent charge against profits from year to year. The result of the method was that reported profits understated the benefits of boom years, since the profits of the peak years of 1899–1900, 1900–01 and 1907–08 had to bear extra charges of £11,000, £25,000 and £10,000 respectively, which had no equivalent in other years.[14] On the other hand, from 1911 depreciation did become consistent. Moreover, over the long term the company was retaining sums sufficient for capital investment on a significant scale. Though the profits of individual years were not fairly stated, the average profit over the period 1898–1914 was probably not misrepresented as a result of depreciation.

Depreciation provisions, even if imperfect, did at least appear in the balance sheets. No trace of some capital expenditure, however, ever appeared in the balance sheets: replacement accounting was a feature at the Griff company too. In view of the extent of depreciation provisions, it was particularly inappropriate for the company to write off against profits the total cost of capital equipment in the year the purchase was made. The consequent understatement of profits, especially in boom years, is shown in Figure 1. This treatment of items which had many years of life, such as boilers, a cutting machine, a new siding, a locomotive and enlargement of the canal basin, represented a conscious policy on the part of the directors. Each year, when the preliminary results for the year were known, they considered the breakdown of expenditure on 'capital account' and invariably decided to write it all off to revenue (WRO/CR1329/1). It was also conscious policy to spend as much as possible on capital improvements during a boom year, whatever the effect on the consistency of profit figures from year to year. This policy was of course in many ways inevitable and sensible, for it was in boom years that cash was in abundance. In 1901 Melly stated in his annual report that: 'the policy of improving and renewing plant while things were good was carried out on a large scale both in machinery and buildings' (CR1169/22).

Was the Company Overvalued?

As with the other companies in the sample, one must not judge the inappropriateness of the accounting treatment of additional capital expenditure without also assessing the appropriateness of the balance sheet valuation of the enterprise as a whole. The policy of writing off all (and not just some) capital expenditure against profits was a feature of company policy only after 1898 and the revaluation of the enterprise. It was perhaps no coincidence that both planned and actual growth were much slower from about 1902 than they had been previously. Prior to 1898, while the balance sheet capitalisation of the concern was low and a

---

[12] The overall development of the company is discussed in Wale (1989a).

[13] The neighbouring colliery belonged to the owners of the mineral rights at Griff, the Newdegate family, who were seriously threatening to terminate the lease held by the Griff company at the next option date.

[14] The total of £46,000 referred to here represents the £21,000 'depreciation' and the £25,000 general reserve discussed in the previous paragraph.

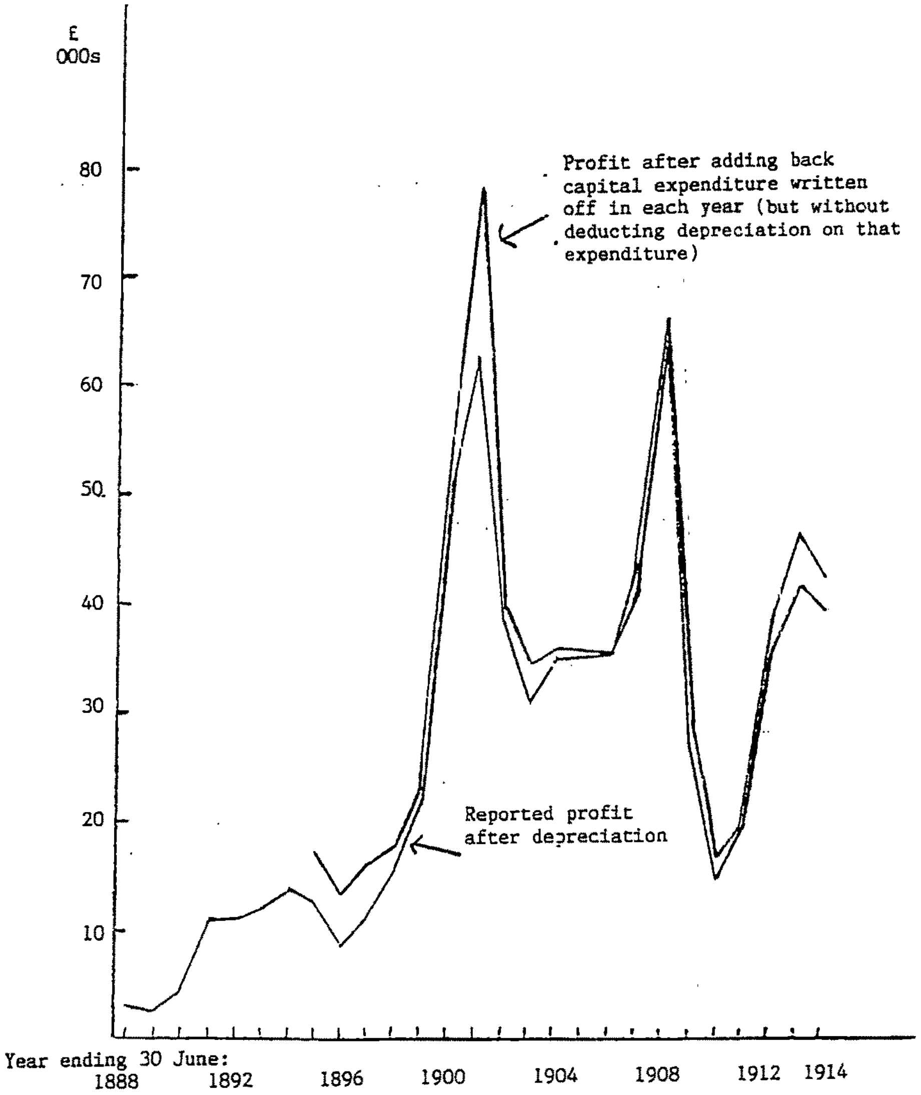


Figure 1

Profits available for dividends or for reinvestment at the Griff Colliery Co. Ltd., 1887–1914: comparison of reported profit after depreciation with profit after depreciation corrected for capital items written off.

Sources: WRO/CR1169/22; CR1329/1.

Notes (1) Figures for capital expenditure written off between 1888 and 1894 have not survived. Except in 1894 such expenditure was substantial and it included the purchase of a brickworks. The amount shown in this graph for 1899 has not been adjusted downwards for the sale of the brickworks for £1,200.

(2) Out of the profits shown above, £15,000 in 1901 and £10,000 in 1908 were taken and placed in a general reserve fund, which was carried forward in the balance sheet from year to year. The total was still £25,000 in 1914.

new pit was being sunk, a considerable amount of expenditure was capitalised, though much new machinery was written off against profits (Figure 1) (CR1169/22). The gross amount capitalised represented additions to the £11,300 which was spent on purchase of the concern and additional machinery during the first year of operations in 1882–3 (CR764/132–3). Capitalisation of expenditure on the two older pits ceased after 1892, by which time the total fixed asset figure had nearly doubled to £20,500 (CR1169/22). Between 1891 and 1894 £44,700 representing the sinking costs of Clara pit was capitalised. When Clara pit became operational, the normal practice of 'closing the capital account' was followed. From 1 July 1894 the remaining development expenditure (£1,600 in 1894–5) was written off against profits (ibid.). Further expenditure capitalised comprised the creation of Bermuda colliery village at a cost of £10,000 and the purchase of railway wagons at a cumulative cost of around £22,000. In 1898, therefore, the balance sheet showed a gross total (before depreciation) for fixed assets of somewhat less than £100,000,[15] which represented the actual purchase cost of a new pit sunk and assets acquired over the previous sixteen years. The net figure after depreciation was £13,000 less.

It was natural that the enterprise should be revalued in order to reflect the increase in value of the shares which resulted from the great expansion in the scale of the enterprise and its much enhanced earning capacity. The goodwill created by modernisation and expansion required formal expression in the balance sheet. It is less clear whether the number and nominal value of the new shares in the technically re-formed company and the new value of the fixed assets in the balance sheet were appropriate. Both values need to be related as reasonably as possible to the likely length of life of the enterprise and its likely future annual profits. It appears that the 'old colliery', together with the cottages and the railway wagons, retained their previous book values after 1898. The new total of fixed assets of £193,884 was very much higher than the old because the figure for the 'new colliery' (Clara pit) was changed from £40,700 (£44,700 less £4,000 depreciation) to £149,718. The 'new colliery' comprised £83,000 for goodwill and £66,718 for fixed plant (CR1329/1). By 1914 depreciation had reduced the fixed asset total to £163,884 (CR1329/6).

There are two ways in which the appropriateness of the valuation can be tested. It seems in the first place that the value of the wagons was not overstated in the balance sheet in 1898 at a figure of £22,000, since they had been separately valued in 1895 at £24,500 (CR1169/22). The total value was later understated, since the wagons which were purchased for £15,000 in 1900–1 were immediately written off against profits (ibid.).

A second way to examine the appropriateness of the valuation is to relate it to the value which was given to the shares in some of the few transactions that did take place in this private company. Two years before the revaluation of the company, a circular was sent to all shareholders, inviting them to sell their shares at £125 each; in other words, at a large premium above the £50 which had been called up (ibid.). Only 22 out of 400 shares were however sold at this price. When the new company was formed, each shareholder received £250 called up value of new shares (and £150 $4\frac{1}{2}$ per cent debentures) in return for each old share (that is, eight times the previous called up value). Values of shares and debentures realised in transactions at various dates were as shown in Table 1:

Table 1
Nominal and market values of the shares and debentures issued by the Griff Colliery Company Ltd.

	Ordinary shares		*Preference shares and debentures*		
	Called up	*Market value*		*Market value*	
			Par value	*Preference*	*Debentures*
	£	£	£	£	£
1901	$33\frac{1}{3}$	50	50	(no sales)	(no sales)
1909	$33\frac{1}{3}$	95	50	45	45
1912	$33\frac{1}{3}$	85–6	50	40	43.5

Source: WRO/CR1329/1

This evidence on share transfers does not, taken as a whole, make the enterprise appear overvalued before 1914. Though during the years 1910–14 the outlook was less promising than previously, the depreciation charge meant that the change was reflected in the accounting records.

If the enterprise had been overvalued, then the failure to capitalise new expenditure after 1898 (see previous section) would perhaps have been appropriate. The understatement of new assets resulting from this policy would have compensated for the overstatement of the value of older ones. Since, however, it does not appear that the valuation figure was too high, one may conclude that writing off new assets against profits was an incorrect policy. Bearing in mind that reported profits were as a result somewhat understated, higher profits would also have indicated greater earning capacity and thus a higher valuation.

Conclusion

The recorded figures of the value of the fixed assets of colliery companies were arrived at by differing methods at varying dates. In most cases they failed to provide a fair picture either of the cost of assets or of the value of the company as a going concern. On the whole the initial fixed asset total had probably been reasonably accurate. A fair picture of a new pit could be provided by the standard practice: the accumulation of its sinking and development costs. Alternatively, the revaluation of a company on the basis of reasonable assumptions about its future earning capacity could produce a fair portrayal of a company's worth. Normally, however, the passage of time caused these initial values to lose their accuracy. In the case of the accumulation of costs, the figure tended to become inaccurate in two opposing ways which did not necessarily cancel each other out: the failure to charge depreciation on ageing assets and the failure to capitalise new fixed assets which added to the value of the company. A valuation based on earning capacity could become inaccurate, both because the circumstances of the company and hence its earning capacity might change, and because the valuation took no account of further additions to fixed assets (which were probably not capitalised).

---

[15] This is the approximate total of the sums referred to earlier in the paragraph: £20,500, £44,700, £10,000 and £22,000.

Asset values which had been recorded by different methods at different dates also led to a lack of comparability between companies. At any given time the reported asset values of concerns of similar size in terms of output, and even of concerns not dissimilar in age, varied greatly. A further consequence was that the relative asset values of different enterprises of similar size did not rank in at all the same way as their relative profit levels. The lack of comparability also makes it virtually impossible to determine whether a given enterprise was overvalued. Since, moreover, one cannot rely on the accuracy of the asset values, one cannot reasonably use these values to gauge the return on assets embodied within an enterprise.

The value of fixed assets and the level of profits were of course interdependent. The inaccuracy of asset values means that profit figures cannot be relied on either. Profits were generally overstated as a result of failure to charge depreciation, though the inconsistency from year to year of depreciation charges where they did exist meant that a large depreciation charge in a given year might reduce that year's profits excessively. Profits were also understated by the failure to capitalise fixed assets once the initial development of a pit was complete. This failure meant that a single year's profits had to bear the entire charge of the cost of equipment which had many years of life. Most companies can be criticised for these policies, since current best practice was better than the average. The example here of Horden Collieries shows that, though depreciation policies did not meet modern standards of consistency, at least one large company continued to capitalise development expenditure after its pits became operational, while simultaneously beginning to charge depreciation on a reasonably consistent basis. As a result, that company's profit figures and asset values are more reliable than most.

The surviving evidence from the five companies studied suggests that it is likely that the effect of failure to capitalise the continuing purchase of fixed assets, most of which moreover incorporated technological improvements, was greater than the effect of failure to charge depreciation. This means that in most cases reported profit figures were too low. This conclusion goes against Brief's view that cases of accounting error generally overstated profits. The understatement was greatest in absolute terms in boom years, since companies took the opportunity in those years when cash balances were higher to purchase a larger number of new assets. In a boom year, too, overstatement of profits because of lack of depreciation was less likely to occur. This was because, where occasional depreciation charges were made, they tended to occur in a year when the profit after depreciation would still be large enough to provide a substantial dividend. Church has come to the conclusion that:

> Inadequate data, differing contemporary definitions, and ambiguity in evidence, notably in references to interest and depreciation, render the reconstruction of the levels of profit and rates of return extremely difficult, especially before the 1880s (Church, 1986, p. 519).

The results presented in this paper go much further: they indicate that asset and profit figures in the coal industry are in most cases highly unreliable.

It will of course be necessary to carry out many more case studies of accounting practices in the coal industry, within the constraints set by the availability of evidence. Only then will it be possible to determine the representativeness of this small sample of companies in relation to the total population of colliery concerns in the pre-1914 period. Studies are also required for the period from World War I to the nationalisation of the coal industry in 1947.

In spite of the small sample, however, the conclusions drawn in this paper are significant enough to have implications for asset and profit figures in the many other industries which required heavy initial and continuing capital investment by the early twentieth century or before. As shown earlier, the accounting policies of the railways and the iron and steel industry have already been brought to light. There is now a need to treat accounting data from industries such as shipbuilding, other heavy engineering and chemicals with more critical comment than hitherto and to set such profit and asset figures more thoroughly in the context of their company and industry origins.

References

Note: references marked with an asterisk are in summary form only; the documents are described individually in Wale (1987).

Brief, R. P. (1965), 'Nineteenth century accounting error', *Journal of Accounting Research*, vol. 3, pp. 12–31.

Chandler, A. D. (1977), *The visible hand: the managerial revolution in American business* (Cambridge, Mass. Belknap Press).

Chapman, S. D. (1981), *Stanton and Staveley—a business history* (Cambridge: Woodhead-Faulkner).

Church, R. (1986), *The history of the British coal industry, vol. 3, 1830–1913: Victorian pre-eminence* (Oxford: The University Press for the National Coal Board).

*DRO/D/Lo/B: Durham County Record Office, Section B of the Londonderry Papers.

*DRO/NCB4: Durham County Record Office, Section 4 of the National Coal Board deposit.

Edwards, J., Kay, J. A. and Mayer, C. P. (1987), *The economic analysis of accounting profitability* (Oxford: The Clarendon Press).

Edwards, J. R. (1980), 'British capital accounting practices and business finance 1852–1919: an exemplification', *Accounting and Business Research*, vol. 10 (spring), pp. 241–58.

Edwards, J. R. (1981), *Company legislation and changing patterns of disclosure in British company accounts, 1900–40* (London: Institute of Chartered Accountants in England and Wales).

Edwards, J. R. (1986), 'Depreciation and fixed asset valuation in British railway company accounts to 1911', *Accounting and Business Research*, vol. 16 (summer), pp. 251–63.

Edwards, J. R. (1989), *A history of financial accounting* (London: Routledge).

Edwards, J. R. and Baber, C. (1979), 'Dowlais Iron Company: accounting policies and procedures for profit measurement and reporting purposes', *Accounting and Business Research*, vol. 9 (spring), pp. 139–151.

Edwards, J. R. and Webb, K. M. (1982), 'The influence of company law on corporate reporting procedures, 1865–1929: an exemplification', *Business History*, vol. 24, pp. 259–79.

Flinn, M. W. (1984), *The history of the British coal industry, vol. 2, 1700–1830: the industrial revolution* (Oxford: The University Press—for the National Coal Board).

Innes, J. W. and Campbell, T. C. (1913), *Colliery office organisation and accounts* (London: Pitman).

Kay, J. A. (1976), 'Accountants, too, could be happy in a golden age: the accountant's rate of profit and the internal rate of return', *Oxford Economic Papers*, vol. 17, pp. 447–60.

Kitchen, J. (1974), 'Lawrence Dicksee, depreciation and the double-account system' in H. Edey and B. S. Yamey (eds.), *Debits, credits, finance and profits* (London: Sweet and Maxwell).

Lawn, J. G. (1897), *Mine accounts and mining book-keeping* (London: Charles Griffin & Co.).

List of Mines worked in the United Kindom of Great Britain for 1888–1914 (Annual lists published by the Mineral Statistics branch of the Home Office).

Mann, J. and Judd, H. G. (1909), *Colliery accounts*, Accountants' Library, vol. 51 (London).

Mitchell, B. R. (1984), *Economic development of the British coal industry, 1800–1914* (Cambridge: The University Press).

Monkhouse, Goddard & Co. (1905), *Colliery book-keeping and accounts* (Newcastle-upon-Tyne: Monkhouse, Goddard & Co.).

MYB: Mining Year Book, 1902–15, A. N. Jackman (ed.) (London).

*NRO/1274: Northumberland County Record Office, collection no. 1274 on the Cramlington Coal Company Ltd.

*NRO/NCB/BR: Northumberland County Record office, National Coal Board deposit on Broomhill Collieries Ltd.

Parker, R. H. (1980), 'History of accounting for decisions', in J. Arnold, B. Carsberg and R. Scapens (eds.), *Topics in management accounting* (Deddington, Oxon: Philip Allan).

Pollard, S. (1972), 'Capital accounting in the industrial revolution', in F. Crouzet (ed.), *Capital formation in the industrial revolution* (London: Methuen).

*PRO/BT31: Public Record Office, collection BT31, files of dissolved companies.

Richardson, T. and Walbank, J. A. (1911), *Profits and wages in the British coal trade, 1898–1910* (Newcastle-upon-Tyne).

SEOI: Stock Exchange Official Intelligence.

Taylor, A. J. (1980), 'The coal industry', in R. A. Church (ed.), *The dynamics of Victorian business* (London).

Taylor, T. (1986), 'Capital formation by railways in south Wales, 1836–1914', in C. Baber and L. J. Williams (eds.), *Modern South Wales: essays in economic history* (Cardiff: University of Wales Press).

Wale, J. M. (1987), 'Entrepreneurs and managers in the British coal industry, 1880–1914: case studies in business history' (D.Phil. thesis, University of Oxford).

Wale, J. M. (1989a), 'The Griff Colliery Company Limited, Warwickshire, 1882–1914: a case study in business history', *Midland History*, pp. 95–119.

Wale, J. M. (1989b), 'The Cramlington Coal Company, Northumberland, 1824–1914; a case study in business history', *Business Archives*, no. 58 (November), pp. 1–21.

*WRO/CR1169, CR1329, CR764: Warwick County Record Office, 3 collections containing documents on the Griff Colliery Company Ltd.

NATIONAL UNIVERSITY OF SINGAPORE
DEPARTMENT OF FINANCE AND BANKING
LECTURERS/SENIOR LECTURERS/ASSOCIATE PROFESSORS

Applications are invited from candidates who are able to teach in one or more of the following areas at the BBA and MBA levels:

Bank Management
Accounting
Financial Markets and Institutions.
International Finance and Banking
Risk Management and Insurance

Applicants should possess a PhD degree from an accredited university. Those who expect to complete their doctoral programme soon may also apply. New PhD holders begin their career as Lecturers.

Besides appointments on normal 3-year contracts, visiting appointments for one to two years may be considered.

Gross annual emoluments range as follows:

Lecturer	S$50,390–64,200
Senior Lecturer	S$58,680–100,310
Associate Professor	S$88,650–122,870

(STG£1.00 = S$3.16 approximately)

The commencing salary will depend on the candidate's qualifications, experience and the level of appointment offered.

Leave and medical benefits will be provided. Depending on the type of contract offered, other benefits may include: provident fund benefits or an end-of-contract gratuity, a settling-in allowance of S$1,000 or S$2,000, subsidised housing at nominal rentals ranging from S$100 to S$216 p.m., education allowance for up to three children subject to a maximum of S$10,000 per annum per child, passage assistance and baggage allowance for the transportation of personal effects to Singapore. Staff members may undertake consultation work, subject to the approval of the University, and retain consultation fees up to a maximum of 60% of their gross annual emoluments in a calendar year.

The Department of Finance and Banking is a department in the Faculty of Business Administration. There are 8 faculties in the National University of Singapore with a current student enrolment of some 14,000. All departments are well-equipped with a wide range of facilities for teaching and research.

All academic staff have access to the following computer and telecommunication resources: an individual microcomputer (an IBM AT-compatible or Apple Macintosh); an IBM mainframe computer with 16 MIPS of computing power; an NEC SX supercomputer with 650 MFLOPS of computing power; departmental laser printers; a wide spectrum of mainframe and microcomputer software; voice-mail; BITNET to access academic institutions world-wide. In addition, a proposed campus network based on state-of-the-art optical fibre technology will be installed by end of 1990 to facilitate resource sharing and electronic communication for the academic community. An on-line library catalogue will also be accessible by the middle of 1990.

Application forms and further information on terms and conditions of service may be obtained from:

The Director
Personnel Department
National University of Singapore
10 Kent Ridge Crescent
Singapore 0511

NUS Overseas Office
Singapore High Commission in London
5 Chesham Street
London SW1, U.K.
Tel: (071) 235 4562

Enquiries may also be sent through BITNET to: PERSDEPT @ NUSVM, or through Telefax: (65) 7783948

Book Reviews

Assets and Liabilities: Their Definition and Recognition. *Pauline Weetman.* Chartered Association of Certified Accountants, 1989. 44 pp. £9.95.

This research report, by trying to establish what recognition criteria are applied in the UK, sets out to amplify the assertion in ED 42 that 'statements of standard accounting practice apply general principles of recognition and measurement criteria'. Evidence of these criteria is sought from SSAPs and general SORPs and from a study of other accounting practices referred to by commentators on ED 42. The concern is principally with assets and liabilities and includes testing principles inherent in UK practice against the definitions of, and recognition criteria for, assets and liabilities in the IASC *Framework for the Preparation and Presentation of Financial Statements.* Since the ASC has agreed to take the Framework into account in its future deliberations, but has warned that there may be cases of conflict between standards and the Framework, identifying areas of potential conflict is clearly worthwhile.

In her analysis of SSAPs and general SORPs the author focuses on those concerned significantly with recognition issues and groups them into those which do, and do not, apply reasoning consistent with IASC recognition criteria. Only recognition criteria explicitly referred to in the statements are identified on the basis that 'if the reasoning is not clear then there can be no public acknowledgement that established recognition criteria do exist'. This is perhaps too stringent a test. One of the IASC recognition criteria, for example, is that the item should have a cost or value that can be measured with reliability, yet, as the report later acknowledges, a need for reliability is sometimes so obvious that it is not specifically stated in the SSAP. Although the author provides a checklist against which the statements have been tested, the actual analysis and conclusions are sometimes summarised rather briefly. For example, SSAP 9 on stocks and long term contracts is classified as being satisfied by the IASC recognition criteria, but there is no discussion of how an item such as 'Amount recoverable on contract' fits into the scheme of things. Nonetheless, the report succeeds in showing that the reasoning contained in several standards is not fully compatible with the Framework. SSAPs 4 and 24 are shown to rest on application of the matching concept with no specific consideration of the nature of the residual balances; SSAP 22 is stated to be based on a desire for consistency between purchased and non-purchased goodwill; SSAP 21 focuses largely on an assessment of risks and rewards; and a concern for relevance to user needs in SORP 2 leads to the application of very different recognition criteria for charities from those used for profit-seeking concerns.

The analysis of factored debts, securitised receivables, deferred costs and deferred credits—four problems referred to by those responding to ED 42—is more detailed, and the author shows that consideration of the various risks associated with an item often becomes critical in deciding whether to recognise an asset. Given that in ED 42 the ASC drew on FASB's definitions, a pertinent part of the analysis is that the distinction between FASB's definition of an asset (based on 'probable future economic benefits...') and IASC's definition (based on 'a resource controlled by the enterprise...') could prove crucial in analysing many off-balance sheet financing schemes where an enterprise retains effective control of the benefits but has no control of a resource. The author rightly points out, also, that defining an asset in terms of a 'resource' may simply shift the problem from one of defining an asset to one of defining a resource. One unclear aspect of the deferred cost analysis concerns the pre-opening expense of a business. In later paragraphs the terms 'pre-incorporation expenses' and 'expenditure... on the formation of a company' are used; however, unlike pre-opening expenses, it is not clear how these two terms differ from 'Preliminary Expenses' which under the Companies Act 1985 may not appear as an asset of the company. (That prohibition itself raises an interesting question, not considered, as to the status of an item meeting the criteria but which, by law, may not be shown as an asset.)

This project does not aim to be an exhaustive survey of UK recognition practices. But it shows that many practices use criteria for identifying and recognising assets and liabilities different from, or additional to, those in the Framework, and that many off-balance sheet financing schemes cannot be captured by the IASC definitions. The author concludes that UK practice suggests that the only necessary element of the definition of an asset is an expectation of future benefit, and of a liability an expectation of an outflow of economic benefit. For recognition, criteria based on reliability of measurement and probability of future inflows or outflows of benefits are necessary but not sufficient to explain UK practice which often depends on features such as matching, risks and rewards, consistency and 'the ASC's collective wisdom', features which, the author suggests, reflect a concern with relevance and prudence. She suggests how the IASC definitions could be modified, and implies that they should be redrafted, to encompass these additional criteria. Given that FASB's concepts statements on elements and recognition criteria were heavily criticised for seeking refuge in current practice, this raises the whole question of what a conceptual framework should aim to achieve. Noting that 'it is convenient for academic model-builders to dismiss as Philistines those who do not fit a prescribed pattern' Ms Weetman wants a framework to 'relate to existing practice and to rationalise existing practice' and she criticises all of the major conceptual frameworks for being based on 'a normative approach of stating what would be desirable in an ideal world based upon some notion of user needs and objectives of financial statements...'. There are no doubt many who would take a different view.

London School of Economics Christopher Noke

The Evolution of Auditing Thought and Practice. *T. A. Lee (ed.)* Garland Publishing, 1988. 316 pp. $47.

This book review is different. Rather than providing a catalogue of the authors and their articles (which can be obtained from the publisher's catalogue), or a list of articles I would have included in a similar book, I attempt to establish what I see as the main points for recommending this book of readings to teachers, students and researchers of auditing. I strongly recommend that the underlying approach adopted in this book be used in the teaching of undergraduate or postgraduate courses and believe that this book would make a very valuable supplement to many main auditing textbooks.

This book of readings contains 22 previously published papers and also a substantial introductory essay by the editor. The introductory essay outlines the purpose and selection criteria. One stated aim of the book is to 'satisfy historical curiosity about auditing with as much objectivity as possible' (p. xi). Another aim is to redress an imbalance: historical studies of auditing receive little attention from accountants. A cursory glance at the current crop of academic research, teaching and professional literature in Australia, which contains very little understanding of or reference to the historical developments of past audit practice, organisation and institutional arrangements, leads this reviewer to agree with Lee's second statement. I do, however, question his assertion of objectivity. A brief glance at the author's recent auditing textbook (Lee, 1986, p. ix) indicates that he strongly believes that to understand current practices one needs to examine the basic ideas and reasons behind audit practice (i.e. their historical development). Lee is overtly proactive in the ideas which he wishes to promote through this book of readings. He states that, just as the audit function of the 1880s faced an uncertain future with regard to the role and responsibilities of auditors, so it does in the 1990s.

He adopts a socio-historical perspective in the selection of themes for inclusion or exclusion. Articles selected examine the development of basic ideas and reasons behind audit practice in a social, political, institutional and organisational context in order to gain a fuller understanding of the audit function.

In his foreword, Lee establishes criteria for the selection of the 22 articles, and postulates that auditing change is shaped by changes in the economic environment and that the social actors (e.g. auditing practitioners) have been central to the shaping of audit practices and institutional arrangements. For example, the emergence of the accounting profession can explain certain aspects of auditing practice, and current corporate auditing practices have their antecedents in the late 19th and early 20th century. The emphasis is upon examining a turbulent history in which there has been change, continuity, discontinuity and choices made about what is, who should practise, and the rewards of, the corporate audit function.

The editor's own perspective on the researching and teaching of auditing has helped to structure the framework for this book of readings. He has three main themes. The first is environmental influences affecting audit. These include economic circumstances, the nature of accounting, the audit profession, management needs and individual influences. The emergence of the audit profession, audit responsibilities and auditor independence comes second. Third, he presents the role of the auditor in accountability, fraud detection and resistance to change. The value of this book is not only in the collection of articles reprinted, but also in the framework which Lee has produced for the examination of the evolution of audit thought and practice throughout the last century.

Historically, auditing has been regarded as an essentially practical subject with very little need for theoretical explanation. The trend in the present teaching of auditing is to place great emphasis upon technical practice as reflected in the current crop of auditing standards and current 'hot' technical issues, or on empirical research methods. But Lee and others argue that the teaching of auditing should be linked to its social origins: auditors and their technical practice are involved in economic and political interplay.

There are several limitations to Lee's book. First, very little original work is included. Second, the scope is limited to company auditing, rather than including all forms of audit. Third, although the publication date was 1988, the latest work was 1985, and the bulk of selected material was published in the early 1980s. There have, however, been several excellent pieces of work since then. But these limitations can be overcome by the production of a further book on the history of auditing.

In summary, for those academics who are seeking to observe and add to audit thought and practice through a socio-historical perspective, this book of readings is a must. For those academics who are intent on understanding audit thought and practice via the current popular North American approaches (e.g. agency perspective, human information processing, behavioural and judgmental research) to audit research and development of the discipline, this book has limited value. These North American approaches are well represented in many leading research journals today. Just because Lee ignores or gives little significance to them, the socio-historical perspective and his importance as an academic should not be dismissed as being irrelevant.

University of New South Wales James Guthrie

Reference

Lee, T. (1986), *Company Auditing* (Van Nostrand Reinhold, London).

Accounts, Accounting and Accountability. *G. Macdonald and B. A. Rutherford (eds.).* Van Nostrand Reinhold (International), 1989. xii + 221 pp. £25.

This volume has been published as a tribute to Peter Bird. Until his untimely death in 1987 Peter Bird was professor of accounting at the University of Kent at Canterbury, and was earlier a lecturer at the London School of Economics. At the LSE this reviewer was in one of Peter Bird's classes and can endorse the Preface when it says: 'Intellectual breadth and clarity of reasoning combined with humility and tolerance made him an excellent communicator with both students and practitioners.'

In view of Peter Bird's wide interests, it is fitting that the authors should include academics and practitioners, a lawyer and a regulator. They are listed as John Arnold, W. T. Baxter, Michael Bromwich, Harold C. Edey, Don Hanson, Graeme MacDonald, R. H. Parker, B. A. Rutherford, Clive M. Schmitthoff, Geoffrey Whittington, Robert Willott and Sir Bryan Carsberg. Each author writes alone, but some papers complement each other so well that they can be considered as pairs.

Arnold writes on *Accounting education and research: the role of the universities.* He argues for the teaching of conceptual and analytical skills by academics, and for the teaching of technical knowledge by the private sector. We may applaud, but may find it less easy to agree on the dividing line for professional accreditation. On research he notes the differing preoccupations of researchers and practitioners, such as the distancing of much positive research from the problems of practice. He goes on to make what academics would regard as sensible cases for research funding from both government and the profession.

Bromwich takes up the issue of the practical impact of research. In *A decision required on decision-orientated accounting* he questions the effects of the 'revolutionary' move of accounting theory from stewardship to the perceived needs of users. Although the FASB concepts adopt a user view, he argues that standard-setters are wedded to conservatism. He suggests that accounting reports may be regarded as scoring devices. As with the rules of games, 'it is unnecessary that the scoring systems make complete sense', but researchers should seek to understand as well as criticise.

Baxter, in *Income: a will-o'-the-wisp?*, takes the income theory lecture Peter Bird would have heard as an undergraduate and recasts it for today. Hicks remains the starting point for progress to such matters as the realised profits rule now enshrined in the Companies Act 1985. Baxter rightly makes a plea that our textbooks should be more explicit about the effect of risk on income measurement. He also points out that accountants are prepared to use current cost when it suits them, which is a theme of Whittington's paper.

Whereas Baxter quotes farm accounts as a breach of the HC convention, Whittington looks at standards in *The valuation problem in contemporary financial reporting in the United Kingdom.* He systematically reviews the ways in which standards allow or require values to depart from HC. His formidable list ranges from fixed asset revaluations to off-balance-sheet financing. By the end nobody could doubt that 'the system is a hybrid, with different methods of valuation being preferred for different types of transaction, and with a considerable degree of choice . . .'.

Edey and Rutherford explore aspects of that elusive concept, the true and fair view. In *True substance and fair reporting* Edey starts from a comment of Peter Bird's: the maxim of 'substance over form' calls for a 'normal form' which a given substance can take. Edey proceeds to the ways in which legal rules on distributions mould accounts to the detriment of performance reporting. He concludes with pleas for imitating best management accounting methods and for more communication of the approximations of accounting numbers.

Rutherford, in *The true and fair view doctrine: some recent developments*, puts the true and fair view into an international context. Australia, the European Community, Hong Kong, and international auditing guidelines all offer different ideas on the concept. The UK's Inland Revenue, in using true and fair view for profit-related pay schemes, adds further problems. Rutherford brings no comfort to those who would like to know what true and fair really means, and ends by cautiously questioning whether the concept has any substance.

Hanson and Macdonald deal with issues in accounting regulation. In *The future of self-regulation*, Hanson proposes nine elements which are needed for a successful UK self-regulatory system. Of these at least one, a unified profession, is further away than when the paper was written. But others, such as the reform of the standard-setting process, are somewhat nearer. Among his proposals deserving attention is one for the licensing and review of quality control of individual audit firms.

Macdonald, in *Accounting standards and special purpose transactions—some lessons from taxation*, is concerned with 'standards avoidance' and the problems of enforcement. He explores how a Standards Board set up under a Companies Act might learn from the tax system. One suggestion is that the Board might imitate the tax clearance obtainable for treatment of transactions. But he points out that such a system would require some form of conceptual framework as the basis for judgments.

A very different path is followed by Parker in *Accounting basics: language, writing materials, numerals and calculation*. He surveys the ways in which changes in language and materials/technology have affected accounting methods in the UK from Roman times to the present day. In retrospect the changes may seem inevitable, but Parker records such strong resistance that it is tempting to believe that at least the character of accountants is constant.

Schmitthoff writes on *Foreign currency capital clauses*, an issue which came to public attention in the Scandinavian Bank Group case. He reasons that both public and private companies may be formed in the UK with a capital expressed in foreign currency or currencies; indeed at least 125 are already registered. Schmitthoff suggests that the economic effects could be enormous if the UK becomes an even more popular venue for companies trading internationally.

In *Accounting for business combinations*, Willott addresses issues which have become the subject of ED47 and ED48. He exposes the irrationality of merger accounting, and argues that all forms of takeover should be treated as acquisitions. He would, however, allow merger accounting for the reorganisation of existing groups. His suggested outline for a new accounting standard looks more attractive to this reviewer than ED48.

Carsberg, as regulator for telecommunications, writes on *The regulation of privately owned utilities: an accounting challenge*. One issue he considers is that of balancing economies of scale against the efficiency incentives of competition. Another is the question of HC versus current costs, and the problem of basing regulation on one measure while shareholders reports are based on another. The latter seems a curious concern for someone who used to be a vocal advocate for current cost; a valid regulation basis is worth adopting regardless of the way a company chooses to report its results.

The papers in this volume offer a range of interesting and provocative ideas. They have a clarity which would have met Peter Bird's approval, and they provide a fitting tribute to his memory.

University of Bristol Don Egginton

Accounting and Business Research

Accounting and Business Research

Editors:
R. H. Parker, University of Exeter
C. W. Nobes, University of Reading

Board of Editorial Referees
J. Arnold, University of Manchester
P. W. Bell, Boston University
A. M. Bourn, University of Southampton
M. Bromwich, London School of Economics
P. Brown, University of Western Australia
D. A. Burgstahler, University of Washington
D. J. Cooper, University of Alberta
D. A. Egginton, University of Bristol
M. Firth, University of Colorado at Denver
J. Flower, Commission of the European Communities
T. A. Lee, University of Edinburgh
R. Ma, Brisbane
G. B. Mitchell, Institute of Chartered Accountants in England and Wales
D. T. Otley, University of Lancaster
J. M. Renshall, KPMG Peat Marwick McLintock
L. Revsine, Northwestern University
J. M. Samuels, University of Birmingham
D. Simunic, University of British Columbia
L. C. L. Skerratt, University of Manchester
D. Solomons, University of Pennsylvania
C. R. Tomkins, University of Bath
D. P. Tweedie, Accounting Standards Board and University of Bristol
M. Walker, University of Manchester
G. Whittington, University of Cambridge
G. Whittred, Australian Graduate School of Management
B. S. Yamey, London School of Economics
S. A. Zeff, Rice University

Editorial Office:
R. H. Parker, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK. Tel: 0392 263209
Fax: 0392 263305

Advertisement and Subscription Office:
40 Bernard Street, London WC1N 1LD, UK. Tel: 071 628 7060

The Institute of Chartered Accountants in England and Wales

Incorporated by Royal Charter, 11 May 1880

Institute Offices and Library:
Chartered Accountants' Hall, Moorgate Place, London EC24 6EQ. Tel: 071 628 7060

The views expressed in *Accounting and Business Research* are not necessarily shared by the Council of the Institute of Chartered Accountants in England and Wales. Articles in *Accounting and Business Research* are published without responsibility on the part of publishers or authors for loss occasioned to any person acting or refraining from action as a result of any view expressed therein.

© 1990 The Institute of Chartered Accountants in England and Wales.

ISSN 0001-4788

Accounting and Business Research
Volume 20 Number 80 Autumn 1990

Contents

Multinational Performance Measures and Their Association with Contextual Variables — Istemi S. Demirag — 275

Some Issues in Corporate Hedging Policy — S. Eckl, J. N. Robinson — 287

Standard Setting for the Financial Reporting of Religious Business Organisations: The Case of Islamic Banks — Rifaat Ahmed Abdel Karim — 299

The Accounting Burdens Facing Small Firms: An Empirical Research Note — Kevin Keasey, Helen Short — 307

A Longitudinal Study of Accounting Changes: The UK Gas Industry 1969–1974 — W. M. McInnes — 315

Accounting Standards and the Judiciary — G. W. Radcliffe — 329

Origins of the Plan Comptable Général: A Study in Cultural Intrusion and Reaction — Peter E. M. Standish — 337

The Use of Computers in Accounting Course: A New Perspective—A Comment — P. A. Collier, G. R. Kaye, B. J. Spaul, B. C. Williams — 353

Restricting the Domain and Potential of Cash Flow Accounting — T. A. Lee — 355

Book Reviews — 359

Bound Volumes of Accounting and Business Research

Bound volumes with index of Volume 8 1977–78 onwards are available from the Subscriptions Manager, Accounting and Business Research, 40 Bernard Street, London EC1N 1LD, England.
Subscribers wishing to have their own copies bound should address their enquiries to Messrs. George Woodhead and Co., 1 Gloucester Street, Manchester M1 5GP, England.
Microfilmed copies of back numbers are available from Microfilm Ltd., East Ardsley, Wakefield, West Yorkshire WF3 2AT, England.

Subscription Rates

	UK	Overseas	Overseas Airmail
Individual	£23	£25	£30
Student	£12	£13	£18
Corporate/institutional	£34	£35	£40

All subscriptions may be paid in US dollars at current rates of exchange.

CALCUTTA CENTRAL LIBRARY

Forthcoming Articles

E. A. French, The Origin of General Limited Liability in the United Kingdom.

Brian Gibson, Determining Meaningful Sales Relational (Mix) Variances.

Jerry R. Strawser, Using the Human Information Processing Methodology to Evaluate the Consistency of Audit Risk Judgements.

Mark Tippett, An Induced Theory of Financial Ratios.

Walter Taplin Prize

The British Accounting Association and Accounting and Business Research offer a prize of £100 for the best article published in each annual volume. The prize is named in honour of the journal's founding editor, the late Walter Taplin. The prize relating to Volume 19 (1989/89) was awarded to Don Egginton, John Forker and Mark Tippett for their paper on 'Share Option Rewards and Managerial Performance: An Abnormal Performance Index Model' which was published in the Summer 1989 issue.

Reproduction Policy

Permission is hereby granted to reproduce without charge any article in this issue of Accounting and Business Research for use in courses of instruction provided that the source and the author's copyright are indicated in such reproduction.

Objective of Accounting and Business Research

The objective of Accounting and Business Research is the publication of substantial and original contributions to knowledge in the areas of accounting and finance, broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

Accounting and Business Research, Vol. 20, No. 80, pp. 275–285, 1990

Multinational Performance Measures and Their Association with Contextual Variables

Istemi S. Demirag*

Abstract—Demirag (1986, 1987) has shown that UK multinational corporations (MNCs) are 'local currency oriented' in evaluating their foreign subsidiary operations and their managers. The purpose of this study is to investigate the relationships between the foreign currency orientation of UK MNCs in their internal performance measures, and a number of contextual variables. The contextual variables examined include: the size of the firm, organisational structure, the locus of decision making, the industry groups and the operating environments of the firms. The results of this study fail to confirm the expectations derived from the literature and prior research.

Developing appropriate performance measures for overseas operations and managers is a complex issue for multinational corporations (MNCs). Corporate head office managers are not only involved with issues surrounding the performance measures in purely domestic firms but are also faced with the additional question of determining which country's currency should be used in the measurement process. Essentially the choice is either that of the parent company currency or the currency of the local subsidiary. In addition, head office managers may use both parent and local currency performance measures but it is likely that the choice will result in significantly different decisions (Hosseini and Aggarwal 1983; Demirag 1987). Furthermore, if certain decisions are based upon parent currency information and others upon local currency information, problems with goal congruence, motivation and optimisation of resources may occur (Morsicato 1983).

Translated information enables the parent company management to compare financial and management performance of its foreign subsidiaries in a common numeraire and it provides a return produced by the investment in parent company currency. (For example see McInnes 1971; Bursk *et al.* 1971; Robbins and Stobaugh 1973). In addition, translated information also reveals the periodic loss or gain from movements on exchange rates. This information may be useful in measuring the degree of success management has had in protecting the parent company investment against erosion from currency devaluation. The use of local currency information, however, avoids translation gains or losses in performance measures. This could lead to more emphasis being given only to local currency operating results, thus substantially limiting the foreign currency awareness and responsibility of both parent and local subsidiary managers. Furthermore, it is difficult to compare the financial results of various foreign subsidiaries reported in different foreign currency units as boards of directors are generally accustomed to thinking in terms of parent company currency and have their primary interest in the performance of the company as a whole in that currency.

Major research studies carried out among US based MNCs indicate that parent company currency information is widely used in performance measures. (For example see National Association of Accountants 1960; Hawkins 1965; Business International Corporation 1969; Mauriel 1969; The Conference Board 1969; Bursk *et al.* 1971, McInnes 1971, Radebaugh 1974; and Robbins and Stobaugh 1973). More recent US studies, which examined the use of parent and local currency in performance evaluation in depth, have also found a tendency to prefer parent company currency information. (For example see Morsicato 1978; Persen and Lessig 1979; and Czechowicz, Choi and Bavishi 1982).

UK MNCs on the other hand appeared to be using more local currency information in their evaluations (see Demirag 1986, 1987a, 1987b). Demirag (1988) has shown that UK MNCs used a higher number of performance measures in local currency than they did in parent company currency in evaluating their overseas subsidiaries.

To date little research exists attempting to explain the reasons for MNCs' choice of currency used in performance evaluation. This paper reports the results of a study aimed at providing empirical evidence on UK MNCs' currency choices and their association with contextual variables. More specifically, the study investigates the relationship between foreign currency orientation and the size of the firm, organisational structure, the locus of decision-making, the industry groups and the operating environments of the firms.

---

*The author is a lecturer in accountancy and finance in the Management School, University of Sheffield. He is grateful to Clive Emmanuel, Richard Laughlin, Anthony Hopwood Jo Padmore, Kenneth Gee and an anonymous referee, for their helpful comments on an earlier draft of the paper. The normal caveat applies. He also gratefully acknowledges the support of the Economic and Social Research Council for funding the project at the University of Glasgow.

This paper has five sections. Definition of the contextual variables used in the study is in the first section. The next section outlines a theoretical model that identifies the hypothetical relationships between the foreign currency orientation of firms and the contextual variables stated above. Section three discusses the collection of data and survey methodology. This is then followed by an analysis of the results. The implications of the findings are discussed in the last section.

Definition of contextual variables used in the study

The size of a firm is a variable defined in this study as depending upon the level of commitment a firm has to its foreign operations. The level of commitment is defined in terms of both total foreign sales and percentage of foreign sales to total consolidated annual sales. In order to be consistent with prior studies (for example see Robbins and Stobaugh 1973; Morsicato 1978), results relating to percentage of foreign sales to total consolidated annual sales are not reported, but where the two results differ from each other significantly, this difference is indicated in the paper.

The level of commitment based on Total Foreign Sales is determined by: Small (less than £50 million); Medium (from £50 million to £250 million); Large (over £250 million).

The level of commitment based on Foreign Sales as Percentage of Total Consolidated Annual Sales is determined by: Small (from 5% but less than 30%); Medium (30% to 50%); Large (over 50%).

The organisational structure variable is defined to include the five most common categories: International division, Production line, Geographic location, Function, and Global matrix. In the following statistical analysis, organisation by function is excluded because only a few firms indicated the use of this structure.

Locus of decision-making with regard to foreign currency exposure is defined in terms of the level of authority and responsibilities allocated to foreign subsidiary managers for translation, transaction and economic exposures. When respondents were asked to describe their locus of decision-making in relation to currency exposure management practices, the answers varied according to each policy decision being made, amounts involved, location of each foreign subsidiary and above all the perceptions of the respondents. However, respondents were able to determine an overall view of their exposure management practices by choosing among Centralised/Relatively Centralised and Decentralised/Relatively Decentralised categories. The terms 'Centralised/Relatively Centralised' and 'Decentralised/Relatively Decentralised' refer to categories of decision making in relation to Foreign Currency risk management policies, as determined by the perceptions and experiences of the respondents. Hence if these decisions are generally made at parent company level they are regarded as 'Centralised' and if the subsidiary management had been previously consulted, this is regarded as 'Relatively Centralised'. Similarly, if these decisions are generally made at local subsidiary level they are regarded as 'Decentralised' and if the parent company management had been previously consulted this is regarded as 'Relatively Decentralised'.

For the purpose of the study, industries are grouped according to the level of technology: technologically more intensive and technologically less intensive. Level of technology is defined in terms of the research and development expenditure by each industry sector as determined by Stoppard *et al.* (1980). Indeed, the relationship between the research and development expenditure and technology of multinational corporations has been recently pointed out by Pearce (1987) and Dunning (1988, 1988a). Accordingly, technologically more intensive industries include: Chemical and Allied Products, Mechanical and Instrument Engineering, Electrical Engineering and Transportation Equipment. Technologically less intensive industries include: Food, Drink and Tobacco, Textiles, Leather, Clothing and Footwear, Paper, Printing and Publishing, Primary and Fabricated Metals, and Other Manufacturing.

Geographic location is defined to include the following: Europe, Middle East, Africa, Asia including the Far East, Australia, Latin America, North America including Canada. Published annual accounts of the respondent companies were examined and the number of countries in which the firms maintained control over manufacturing subsidiaries were established. However, for the purpose of this study we are only interested in the location of foreign subsidiaries where companies have their principal operations.

Financial measures referred to in the study include the following: Return on Investment (operating profit on operating assets); Return on Equity; Residual Income; Absolute Amount of Profit; Value Added; Cash Flow Potential (the sum of all cash actually remitted to parent firms in an accounting period and sums of cash that could have been remitted but were not, as estimated by the respondents); Budget compared with Actual Return on Investment; Budget compared with Actual

Profit; Budget compared with Actual Sales; Ratios and other measures as specified by the respondents.

Comparative measures referred to in the study include the following: historical data of the subsidiary (prior period(s) balance sheets and income statements); other similar manufacturing units of the firm in the same country; other similar manufacturing units of the firm in different countries; other similar manufacturing units of the firm in the UK; and others, as specified by the respondents.

In this study 'progressive' performance measures were defined to refer to those above-mentioned financial and comparative measures used in local currencies. This definition of 'progressive measures' was also used in Robbins and Stobaugh (1973).

Finally, the terms 'local currency' and 'untranslated financial information' are used synonymously with 'foreign currency financial information'. Similarly 'parent company currency' and 'translated financial information' are used synonymously with 'sterling financial information'.

Contextual variables and hypotheses

This section develops the hypothetical association between the contextual variables defined and the currency choice of MNCs in performance measures used for their overseas subsidiaries.

The Size of the Corporation

Robbins and Stobaugh (1973) examined the financial control function of US MNCs and indicated that the size of the firm's foreign operations and the degree of the firm's foreign experience affected the performance measures used by MNCs to evaluate their foreign subsidiaries. They found that larger firms used more local currency information. More recently, Morsicato (1978) investigated the relationship between size of foreign operations and performance measures used by US MNCs. She divided firms into three different size categories according to their level of commitment to foreign operations. The level of commitment was defined in terms of the annual sales of foreign operations. While the large and small firms did not indicate any significant differences between the number of financial and comparative measures used after or before translation, medium sized firms indicated a strong preference towards parent company currency information. There were statistically significant differences between the number of before and after translation financial measures and these differences for comparative measures approached significance.

In view of the lack of any further empirical evidence on the effects of firms' size characteristics and their choice of currency in performance measures, it was preferred to test the following hypothesis in a null form.

Hypothesis 1

There is no significant difference in the extent to which parent or local currency information is used in measuring foreign subsidiary performance between MNCs with large, medium or small commitment to foreign operations.

The Organisational Structure of the Firm

The organisational structure of the MNC can be viewed as the design by which the enterprise is administered. The relationship between the organisational structure and the control process within organisations is well documented in several empirical studies. For instance, Stopford and Wells (1972), building on Chandler's (1962) work on strategy and structure, maintain that the authority and responsibility of each executive, the kinds of information that flow among executives and the procedures established for channelling and processing information are the three major aspects of an organisational structure. Control processes in organisations have all these three major aspects in common with the design of organisational structures. It is reasonable, therefore, to state that organisational design may influence the control process within companies. Since the performance measures are part of the control function, it is anticipated that firms with different organisational structures would use different performance measures and show different preferences for parent company currency and local currency information.

In the Global Matrix organisation the subsidiary manager usually reports to more than one divisional headquarters; and area and product divisions share the responsibility for subsidiary performance. The main rationale for developing a Global Matrix structure for the company is a recognition by the top management that differences in products and geographic areas are of approximately equal importance to the company and are relatively more important than functional differences. This form of organisation is not yet employed by many MNCs because the philosophy of this approach is still relatively new and progressive. Stopford & Wells (1972), Morsicato (1978), Robock & Simmonds (1973), and Perlmutter (1969) indicate that this form of organisational structure is adopted in the final stage of the evolution of MNCs. As the philosophy of the Global Matrix form of organisation is still relatively new and progressive, it is expected that firms so organised will also maintain progressive philosophies towards the evaluation of foreign operations. It is expected that such firms will show a preference for local currency information.

Hypothesis 2

There is no significant difference in the extent to which parent or local currency information is used in measuring foreign subsidiary performance between MNCs organised by Global Matrix and MNCs organised globally by Function, Product, Geographic area or International divisions.

The Locus of Decision-Making

Daniels *et al.* (1979) indicated that the degree of centralisation or decentralisation exerts influence on the control function of an MNC which in turn affects planning decisions and evaluation of performance. Robbins & Stobaugh (1973) indicated that companies with centralised financial decision-making processes tend to use local currency evaluation measures for foreign operations. This may be because, as the responsibility for exchange gains and losses is shifted to the parent management team, it is reasonable to expect that the performance of foreign subsidiary managers is evaluated in their local currencies, thus releasing them from accountability in parent company currency terms. (For example see Choi & Mueller, 1984, p. 414). In contrast, for companies with Decentralised/Relatively Decentralised currency exposure management policies, the responsibility for exchange gains and losses is expected to be with foreign subsidiary managers. For this reason such companies are expected to be parent company currency oriented in the evaluation of their foreign subsidiaries.

Hypothesis 3

There is no significant difference in the extent to which parent or local currency information is used in measuring subsidiary performance between MNCs with Centralised/Relatively Centralised and MNCs with Decentralised/Relatively Decentralised currency exposure management policies.

The Industry Group of the Organisation

The industry group in which corporations carry out their operations is also considered to have an influence on performance evaluation measures. A number of authors in international business have pointed out the association between industry groups and organisational structure and control within corporations. (For example see Stopford & Wells 1972, p. 54; Robock & Simmonds 1973, p. 434). Since performance evaluation is a part of the control process, it is expected that industry groups will also influence the choice of currencies used in performance evaluation measures.

Stopford & Wells (1972, pp. 56–64) point out that companies in technologically less intensive industries tend to adopt global geographic designs, and for these companies marketing becomes the principal competitive weapon since the production processes are standardised and are probably available to local firms. These companies are sensitive to local regulations and tastes and have a good understanding of local conditions, constraints and preferences. The apparent tendency of technologically less intensive firms to understand and be sensitive to local environmental conditions supports the view that such firms would also prefer local currency information in performance evaluations. Companies in technologically more intensive industries, on the other hand, tend to adopt global product structures which facilitate the transfer of new products between parent and foreign divisions (Robock & Simmonds, 1973, p. 434). In this type of organisational structure the international division is broken up and its products are fed back into the rest, while domestic units become world-wide product groups. Companies operating in technologically more intensive industries are therefore expected to evaluate their foreign subsidiaries in terms of individual product performance on the basis of world-wide comparisons. Accordingly these companies are expected to use more parent company currency measures in their performance evaluation systems because the use of this information is the most convenient way to compare financial results denominated in different currencies.

Hypothesis 4

There is no significant difference in the extent to which parent or local currency information is used in measuring foreign subsidiary performance between MNCs operating in Technologically More Intensive industries and MNCs operating in Technologically Less Intensive industries.

The Geographic Location of the Subsidiary and its Environmental Characteristics

The nature of the environment surrounding the subsidiary is considered to be another contingent variable which could influence the choice of currencies used in performance evaluations.

Lawrence and Lorsch (1967, p. 6) in dealing with domestic corporations as the unit of analysis and the various departments or functional groupings existing within those organisations hypothesised that 'the greater the certainty of the relevant sub-environment, the more formalised the structure of the sub-system'. It is reasonable to generalise the Lawrence and Lorsch (1967) hypothesis to the international level by suggesting that the more certain the subsidiary environment(s) the more formalised the structure of the subsidiary/headquarters relationship in the planning, evaluating and control process.

It was expected that subsidiaries operating in Latin American countries with high rates of inflation, representing a reasonable measure of economic instability, would be evaluated differently from those subsidiaries operating in other geographic locations. Generally, the rates of inflation in Latin American countries are higher than in most other countries. Empirical studies indicated that in the short run exchange rate changes do not compensate for inflation rate differentials between two countries (see Aliber & Stickney 1975). Therefore, in order to determine the effects of exchange rate changes on operations and to see how well the subsidiary managers coped with inflation, the parent company management was expected to evaluate subsidiary operations located in Latin American countries in local currency. As the rate of inflation and inflation rate differentials between the UK and other geographic areas are not as high as in Latin American countries, MNCs operating in other geographic areas were expected to use parent company currency information as this would to some extent eliminate the effects of local inflation.

Hypothesis 5

There is no significant difference in the extent to which parent or local currency information is used in measuring foreign subsidiary performance between MNCs operating in Europe, the Middle East, Africa, Asia and the Far East, Australia, Latin America, and North America and Canada.

Research design

In testing the hypothesis developed in the contingency model developed above, this paper relies on data collected from an empirical study. The following section sets out the research design employed in this paper.

The study was limited to UK based MNCs that had one or more manufacturing subsidiaries overseas, with at least £50 million group consolidated sales and 5% or more of total sales from foreign operations excluding direct export by the parent company. For the purposes of this study 'UK based' MNCs were defined as MNCs with registered head offices in the UK. The empirical data for the study was collected and analysed during the period of 1982–1984 by conducting a two-phase exploratory field study. The first phase involved a questionnaire study covering 105 MNCs and, the second, interviews with 23 financial directors who responded to the questionnaire. The questionnaire was sent to the group financial directors of 256 MNCs, selected from the *Times 1000 1980/81*, using the size and foreign commitment criteria identified above. The questionnaire was completed and returned by 105 of them. The rate of positive response from eligible firms was 46.7%. The overall rate of response (positive and negative responses) for the study was 74.6% (see Table 1).

In order to detect any bias due to non-response, two relevant characteristics of the sample firms were inspected: level of commitment to foreign operations (based on foreign sales excluding direct UK exports) and industry groups. In each case, Chi square tests showed that there was no indication of significant differences between respondents and non-respondents.

The purpose of the personal interviews was to clarify and explore the implications of the results

Table 1
Analysis of the Response of the Sample Firms

Number of questionnaires sent		256	
Ineligible firms		31	
Eligible firms:			%
Positive response	105		46.7
Negative response	55		24.4
No response	65		28.9
		225	100.00
		%	
Positive responses to eligible firms 105/225		46.7	
Total responses to total possible responses 191/256		74.6	
Negative responses to eligible firms 55/225		22.4	
No responses to total possible responses 65/256		25.4	

Ineligible Firms
Firms which had gone out of business, merged, disposed of their manufacturing foreign subsidiaries during the year, or were mistakenly identified from their annual accounts as having overseas manufacturing subsidiaries but in fact had non-manufacturing foreign subsidiaries.

Negative Responses
Firms which had replied to the questionnaire but did not complete it for reasons of confidentiality or lack of available time.

obtained from the postal questionnaire in more depth. The selection of MNCs interviewed was based on: (a) the industry groups; (b) the degree of commitment to and expertise with foreign operations; (c) the answers to key questions in the questionnaire.

An overall attempt was made to interview MNCs in different industry groups, with different levels of commitment to foreign operations and different responses to the key questions in the questionnaire. The questionnaire contained questions relevant to the performance evaluation practices of MNCs, including the design of performance evaluation systems, the techniques, and the methods of translation used for internal management evaluations.

The small, medium and large firms were examined separately as to their use of sterling and local currency financial measures. Differences between the mean numbers of sterling and local currency measures used were tested using Wilcoxon's test. All sizes of firms were found to use more local currency than sterling financial measures (see Table 2). However, this difference was not statistically significant at the 5% level in the case of the medium firms. The numbers of small, medium and large firms using only local currency financial measures were compared with those using only sterling measures. A higher proportion of medium firms was found to use financial measures in sterling only than small or large firms, which explains the lower mean number of local currency measures for medium sized firms. However, the small number of firms using measures only in sterling means that no great reliance can be put on the significance of this result. It is also important to note that when the size is determined on the basis of percentage of foreign sales to total consolidated sales, this relationship was not found to be statistically significant. Similar tests were carried out for comparative measures. No significant differences were found between the mean number of measures used in sterling and local currency and no significant relationship was found between the type of currency and size of firm.

Leaving aside firms using no local currency financial measures, those using some local currency measures were broken down arbitrarily into low, medium and high usage. No relationship was found between size of firm and amount of usage of local currency financial measures. A similar test for sterling measures was carried out, again with no significant result. The same tests were carried out for comparative measures and once again no statistically significant relationships were found.

The financial measures were split into two groups: profit-related (Return on Investment, Return on Equity, Residual Income, Profit, Value Added, Cash Flow Potential, Ratios and others); and budget-related (Return-on-Investment budget, Profit and Sales budgets) measures. Taking these two groups of measures separately, the number of small, medium and large firms using local currency only were compared with those using sterling only. For the profit related measures, again the medium sized firms were found to use more sterling only measures than small or large firms. But when the alternative size criterion was used, this relationship was not found to be statistically significant.

In order to determine whether there is a relationship between the size of the firm and preference for local currency or sterling financial statements, a two-way table was constructed for these variables. The results of the Chi square test for these variables indicate that there are no statistically significant relationships between this observed preference for either UK sterling or local currency financial statements and size of firm. All sizes of firm indicate their preference for local currency financial statements.

Table 2
Summary of the Results of Wilcoxon's Paired Tests: UK Sterling vs. Local Currency Usage for Small, Medium and Large Firms

Size of Firm	*Mean No. of UK Sterling Measures* (a)	*Mean No. of Local Currency Measures* (b)	*Wilcoxon's Paired Test Z-Statistics*	*No. of Firms*	*Probability*
Small	3.25	5.50	3.96	52	0.000*
Medium	3.87	5.07	1.12	30	0.263
Large	3.30	5.22	2.27	23	0.024*
Local average	3.43	5.31	4.22	105	0.000*

(a) Average for the number of after translation Financial Measures used for performance evaluation.

(b) Average for the number of before translation Financial Measures used for performance evaluation.

*$p < 0.05$.

Relationship Between Organisational Structure and Currency Orientation

Firms organised by International Division, Product Line, Geographic Location and Global Matrix were examined separately as to their use of sterling and local currency financial measures. Differences between the mean numbers of sterling and local currency financial measures used were tested using Wilcoxon's test. All the organisational structures of firms were found to use more local currency than sterling financial measures, though this difference was not statistically significant at the 5% level in the case of firms organised by Global Matrix (see Table 3). Kruskal-Wallis one-way analysis of variance design was also used to analyse the difference by organisational structure of firms on the sum of financial measures used in sterling and on local currency. No statistically significant differences were found between the organisational structures and the number of sterling or local currency financial measures. The total average for sterling financial measures, 3.44, is lower than that for local currency financial measures, 5.32, indicating an overall preference by organisational structure for local currency information.

Tests similar to those used for the size criterion were carried out for the organisational structure. None of the tests used on financial measures was found to be significant.

Similar tests were also carried out for comparative measures. No significant differences were found between the mean numbers of comparative measures used in sterling and in local currency. However, statistically significant differences at the 5% level were found between organisational structures in regard to the sum of sterling comparative measures, though this difference was not significant for local currency comparative measures (see Table 4). A comparison of mean values shows that the mean value for sterling comparative measures for the international division is only 0.62 in contrast to the mean values for Product Line 1.63, Geographic Location 1.03 and Global Matrix 1.56. Clearly the difference between the International Division and the other forms of organisational structure in the use of sterling comparative measures accounts for the significant result. No significant relationship was found between the organisational structure of the firms and type of currency used. No significant differences were found between the organisational structure of the firm and the amount of usage of local currency or sterling comparative measures.

In order to determine whether there is a relationship between organisational structure of the firm and preference for local currency or sterling financial information, a two-way table was constructed for these variables. The result of the Chi square test for these variables indicates a statistically significant relationship. This relationship suggests that companies organised by Geographic Division have a greater tendency to prefer sterling statements to other forms of organisational structures (see Table 5).

Relationship Between Locus of Decision-Making in Exposure Management and Currency Orientation

Centralised/Relatively Centralised and Decentralised/Relatively Decentralised firms were examined separately as to their use of sterling and local currency financial measures. Differences between the mean numbers of sterling and local currency measures used were tested using Wilcoxon's test. Both groups of firms were found to use significantly more local currency than sterling financial measures. The same tests used for the size criterion were also carried out in relation to the locus of decision-making in exposure management. None

Table 3
Summary of the Results of Wilcoxon's Paired Tests and Kruskal-Wallis One-Way Analysis of Variance Tests: UK Sterling vs. Local Currency Usage by Organisational Structure

Organisational Structure	*Mean Value of UK Sterling Measure* (a)	*Mean Value of Local Currency Measure* (b)	*Wilcoxon's Paired Test Z-Statistics*	*No. of Firms*	*Probability*
International division	2.19	5.50	2.57	16	0.010*
Product line	3.13	5.37	2.56	30	0.011*
Geographic location	3.77	5.22	2.19	31	0.028*
Global matrix	4.20	5.28	1.20	25	0.231
Total average	3.44	5.32			
Kruskal-Wallis	3.264	0.170			
Chi square probability	0.353	0.982			

(a) Average for the number of after-translation Financial Measures used for performance evaluation.
(b) Average for the number of before-translation Financial Measures used for performance evaluation.
*$p < 0.05$.

Table 4
Summary of the Results of Wilcoxon's Paired Tests and Kruskal-Wallis One-Way Analysis of Variance Tests: UK Sterling vs. Local Currency Comparisons by Organisational Structure

Organisational Structure	*Mean Value of UK Sterling Measure* (a)	*Mean Value of Local Currency Measure* (b)	*Wilcoxon's Paired Test Z-Statistics*	*No. of Firms*	*Probability*
International division	0.62	1.12	1.33	16	0.184
Product line	1.63	1.57	0.33	30	0.740
Geographic location	1.03	1.22	1.71	31	0.476
Global matrix	1.56	1.64	0.14	25	0.889
Total average	1.28	1.41	0.629	102	0.530
Kruskal-Wallis	8.362	1.944			
Chi square probability	0.039*	0.584			

(a) Average for the number of after-translation Comparative Measures used for performance evaluation.
(b) Average for the number of before-translation Comparative Measures used for performance evaluation.
*$p < 0.05$.

of the tests applied to financial and comparative measures was found to be significant.

Relationship Between Industry Groups and Currency Orientation

Technologically more intensive and Technologically less intensive firms were examined separately as to their use of sterling and local currency financial measures. Differences between the mean numbers of sterling and local currency measures used were tested using Wilcoxon's test. Both groups of firms were found to use more local currency than sterling financial measures. Tests similar to those used for the size criterion were also carried out in relation to Industry groups. None of the tests applied to financial and comparative measures was found to be significant.

Relationship Between Geographic Location of Subsidiaries and Performance Evaluation Measures

The use of sterling and local currency financial measures were separately examined for each geographic area. Differences between the mean numbers of sterling and local currency measures used were tested using Wilcoxon's test. Firms operating in all geographic areas were found to use more local currency than sterling financial measures. However, this difference was not significant in the case of firms operating in the Middle East and Latin America (see Table 6).

The small, medium and large firms operating in each geographic area were examined separately as to their use of sterling and local currency financial measures (see Table 7). Differences between the mean numbers of sterling and local currency measures used were tested using Wilcoxon's test. Small firms operating in all geographic areas except in Latin America, showed a statistically significant difference between the use of sterling and local currency financial measures. (Note that there are no small firms operating in the Middle East.) However, all the medium firms, and the large firms with the exception of North America and Canada, did not show a significant difference between these variables. For small and medium firms,

Table 5
Summary of Organisation Structure of Firm of which Financial Statements are Preferred for Performance Evaluation

Preferred Choice of Currency	*Firms Organised by Product Lines* $n = 30$	*Firms Organised by Geographic Location* $n = 30$	*Firms Organised by Global Matrix* $n = 25$	*Firms Organised by International Division* $n = 16$
Local currency	28	21	23	15
UK sterling	2	9	2	1

*Chi square 9.34, df. 3, $p = 0.025$.

*All expected values exceeded 2 in the above table. According to Everitt (1977) this does not affect the validity of the Chi square tests carried out.

Table 6
Summary of the Results of Wilcoxon's Paired Tests: UK Sterling vs. Local Currency Usage by Geographic Area

Geographic Area	*Mean Value of UK Sterling Measure* (a)	*Mean Value of Local Currency Measure* (b)	*Wilcoxon's Paired Test Z-Statistics*	*No. of Firms*	*Probability*
Europe	3.41	5.16	3.72	88	0.000*
Middle East	2.60	4.20	0.67	5	0.500
Africa	3.52	5.37	3.22	65	0.001*
Asia including Far East	3.56	5.26	2.78	57	0.005*
Australia	3.62	5.14	2.55	63	0.011*
Latin America	3.78	4.44	0.82	27	0.414
N. America including Canada	3.46	5.14	3.27	84	0.001*

(a) Average for the number of after-translation Financial Measures used for internal performance evaluation.

(b) Average for the number of before-translation Financial Measures used for internal performance evaluation.

$*p < 0.05$.

the findings are similar with the results of previous tests carried out for size of firm only. Yet, in the previous tests, large firms indicated a significant difference between local currency and sterling financial measures whereas the large firms in this analysis, with the exception of North America and Canada, do not have a significant difference between these variables.

A comparison of results between the two different size criteria used in the study also indicated some differences. First, for the size criterion defined as percentage of foreign sales, a significant relationship was found between local and sterling financial measures used by large firms operating in all geographical areas except Latin America and the Middle East. Under the foreign sales size criterion, no significant relationship was found for large firms operating in all geographic areas except North America. Second, a significant difference was found for small firms, defined in terms of foreign sales, operating in all geographic areas except Latin America. When a percentage of foreign sales criterion was employed, a significant difference was found among the small firms operating only in Europe, Asia including the Far East, and North America. However, for both size criteria, none of the medium firms operating in each of the geographic areas indicated a significant difference between the use of sterling and local currency financial information.

Similar tests were carried out for comparative measures. No significant differences were found between the mean numbers of measures used in sterling and local currency for firms operating in each of the geographic areas, and for each size of firm operating in each of these geographic areas. Once again these findings are consistent with the results of previous tests using the size criterion only.

In order to determine the influence of geographic area on the firms' preference for sterling or local currency financial statements, firms were grouped into those operating in Europe versus those not operating in Europe, those operating in the Middle East versus those not operating in the Middle East, etc. Seven Chi square tests were calculated, each test representing the difference in preference of sterling and local currency financial statements for those groups of firms. None of the Chi squares was found to be statistically significant. This indicates that if each geographic area is taken separately, the operating environment does not influence the preference for either sterling or local currency financial statements for internal performance evaluation of foreign subsidiaries.

Summary and conclusions

The study attempted to identify the relationships between the size of firm, industry group, locus of decision-making, organisational structure or operating environment of foreign subsidiaries and measures used in evaluating foreign subsidiary performance. In most cases, there was no statistically significant relationship between these variables and the choice of currencies used in evaluating foreign subsidiary performance. These results represent important findings as they are inconsistent with expectations derived from the literature and prior research.

One possible explanation of the insignificant results found among the contingent variables used in the study may be that the contingent factors examined in the study are not significant in the firms' choice of currency measures. There may be other factors which are more significant. Ignorance may be one and the various sub-systems that exist within the firm could be another.

It is possible that firms are ignorant of the relative advantages of local and parent company currency measures and are therefore using both measures as opposed to just parent company currency measures. This is because if the firms are not confident about the choices of currency they should be using, the use of both currency measures could avoid the wrong choice.

In-depth examination of sub-systems which exist within the firm may also lead to other possible explanations of firms' currency choice in performance evaluations. Three such sub-systems can be identified: performance evaluations by the parent company board of directors, performance evaluation by the group management accountants or divisional controllers, and the foreign subsidiary managers whose performances are evaluated. Such a study would need to consider all these sub-systems within the firm. For example, foreign subsidiary managers may attempt to avoid performance evaluation measures in parent company currency terms if they see the resultant exchange gains or losses as a threat to their own personal goals. The interest of boards of directors, on the other hand, may well be in the parent company currency results. This may be so because parent company currency results could be less confusing, more convenient and more practical to the directors.

A further but related explanation for the wide use of both local and parent company currency measures is that such evaluation measures enable individuals to continue to sponsor or support the performance of a subsidiary even if there is a change in the objectives of the firm. For example,

Table 7
Summary of the Results of Wilcoxon's Paired Tests: UK Sterling vs. Local Currency Usage by Geographic Area and Firm Size

Geographic Area	*Mean Value of UK Sterling Measure* (a)	*Mean Value of Local Currency Measure* (b)	*Wilcoxon's Paired Test Z-Statistics*	*No. of Firms*	*Probability**
Europe					
Small	2.34	5.41	3.88	39	0.000*
Medium	3.76	5.00	1.12	29	0.263
Large	3.80	4.90	1.53	20	0.125
Middle East					
Small	0.00	0.00	—	0	—
Medium	5.00	0.00	—	1	—
Large	2.00	5.25	1.83	4	—
Africa					
Small	2.91	6.09	3.39	23	0.001*
Medium	4.08	4.75	0.52	24	0.603
Large	3.56	5.28	1.89	18	0.059
Asia including Far East					
Small	3.13	5.45	2.61	22	0.009*
Medium	3.80	4.90	0.97	20	0.334
Large	3.87	5.47	1.65	15	0.100
Australia					
Small	3.00	5.70	3.05	24	0.002*
Medium	4.62	4.40	0.08	22	0.938
Large	3.52	5.29	1.73	17	0.084
Latin America					
Small	3.00	4.12	0.94	8	0.345
Medium	4.62	4.50	0.00	8	1.000
Large	3.72	4.63	0.98	11	0.327
N. America including Canada					
Small	3.03	5.30	2.93	33	0.003*
Medium	4.10	4.89	0.69	28	0.490
Large	3.30	5.21	2.27	23	0.024*

(a) Average for the number of after-translation Financial Measures used for internal performance evaluation.

(b) Average for the number of before-translation Financial Measures used for internal performance evaluation.

(c) Small, medium and large refer to the size of the firm's foreign sales: small less than £50m, medium from £50m to £250m and large firms over £250m.

*$p < 0.05$.

if the objectives of the firm's foreign operations change from a return on investment in parent company terms, to local market penetration or local cash flow, then the emphasis would easily be shifted from parent company to local currency measures. In a rapidly changing corporate environment, flexibility is perhaps a synonym for adaptability. Performance of a foreign subsidary can be presented as satisfying the changing objectives of the firm; the use of both local and parent company currency measures is flexible over time, and improves the range over which the board of directors and overseas management can agree on targets and 'good' performance.

These tentative suggestions for the non-significant relationship found between the contingent variables and the choice of currencies require a different methodology from the one used in this study. Instead of using a questionnaire based study, a clinical or field research methodology could be employed by participating in the performance evaluation process of a smaller number of firms over a long period of time.

References

Aliber, Robert L. and Clyde P. Stickney (1975), 'Accounting Measures for Foreign Exchange Exposures. The Long and Short of it', *Accounting Review*, January, pp. 44–57.

Burns, Tom and S. M. Stalker (1961), *The Management of Innovation* (London, Tavistock).

Bursk, E. C., J. Dearden, D. F. Hawkins and V. M. Longstreet (1971), *Financial Control of Multinational Operations* (New York: Financial Executives Research Foundation).

Business International Corporation (1969), *Solving International Accounting Problems* (New York: Business International Corporation).

Chandler, Alfred D. J. R. (1962), *Strategy and Structure* (Cambridge, Mass., The MIT Press).

Choi, F. D. S. and G. G. Mueller (1984), *International Accounting* (Englewood Cliffs, N.J.: Prentice-Hall).

Czechowicz, I. J., F. D. S. Choi and V. B. Bavishi (1982), *Assessing Foreign Subsidiary Performance: Systems and Practices of Leading Multinational Companies* (New York: Business International Corporation).

Daniels, J. D., E. E. Ogram and L. H. Radebaugh (1979), *International Business: Environments and Operations* (Addison-Wesley, 2nd edn.).

Demirag, S. Istemi (1986), 'The Treatment of Exchange Rates in Internal Performance Evaluation', *Accounting and Business Research*, Spring, pp. 157–164.

Demirag, S. Istemi (1987), 'A Review of the Objectives of Foreign Currency Translation', *International Journal of Accounting, Education and Research*, Spring, pp. 69–85.

Demirag, S. Istemi (1987a), 'How UK Companies Account for Foreign Exchange', *Accountancy*, April, pp. 87–88, 90.

Demirag, S. Istemi (1987b), 'How UK Companies Measure Overseas Performance', *Accountancy*, March, pp. 103–105.

Demirag, S. Istemi (1988), 'Assessing Foreign Subsidiary Performance: The Currency Choice of UK MNCs', *Journal of International Business Studies*, Spring, pp. 257–275.

Dunning, John H. (1988), *Explaining International Production* (London: Unwin Hyman).

Dunning, John H. (1988a), *Multinationals, Technology and Competitiveness* (London: Unwin Hyman).

Everitt, B. S. (1977), *The Analysis of Contingency Tables* (London: Chapman and Hall).

Hosseini, A. and R. Aggarwal (1983), 'Evaluating Foreign Affiliates: The Impact of Alternative Foreign Currency Translation Methods', *International Journal of Accounting, Education and Research*, Fall, pp. 65–87.

Lawrence, P. R. and J. W. Lorsch (1967), *Organisation and Environment* (Cambridge, Mass: Harvard University Press).

Lawrence, P. R. (1967), 'Differentiation and Integration in Complex Organisations', *Administrative Science Quarterly*, pp. 1–47.

McInnes, John M. (1971), 'Financial Control Systems for Multinational Operations: an Empirical Investigation', *Journal of International Business Studies*, Fall, pp. 11–28.

Mauriel, John J. (1969), 'Evaluation and Control of Overseas Operations', *Management Accounting*, May, pp. 35–39, 52.

Morsicato, H. Gernon (1978), *An Investigation of the Interaction of Financial Statement Translation and Multinational Enterprise Performance*, Ph.D dissertation (The Pennsylvania State University).

Morsicato, H. Gernon (1983), 'The Effect of Translation on Multinational Corporations' Internal Performance Evaluation', *Journal of International Business Studies*, Spring/Summer, pp. 103–12.

National Association of Accountants (1960), *Management Accounting Problems in Foreign Operations*, (New York: NAA Research Report 36, March).

Pearce, Robert D. (1987), *Host Countries and the R&D of Multinationals: Issues and Evidence* (University of Reading Discussion Papers in International Investment and Business Studies. No. 101, January).

Persen, W. and V. Lessig (1979), *Evaluating the Financial Performance of Overseas Operations (New York: Financial Executives Research Foundation)*.

Radebaugh, Lee H. (1974), 'Accounting for Price-Level and Exchange Rate Changes for US International Firms: an Empirical Study', *Journal of International Business Studies*, Fall, pp. 41–56.

Robbins, S. M. and R. B. Stobaugh (1973), 'The Bent Measuring Stick for Foreign Subsidiaries', *Harvard Business Review*, September-October, pp. 80–88.

Robock, S. H. and K. Simmonds (1973), *International Business and Multinational Enterprise* (Homewood, Ill., Irwin).

Stopford, J. M., J. H. Dunning and K. O. Haberick (1980), *The World Directory of Multinational Enterprise* (Macmillan Reference Book).

Stopford, J. M. and L .T. Wells (1972), *Managing the Multinational Enterprise* (New York: Basic Books).

THE
ACCOUNTING
REVIEW

Quarterly Journal
of the
American Accounting Association

Managing Editor and Editor
WILLIAM R. KINNEY, JR.
University of Texas at Austin

Editors
ROBERT LIBBY
Cornell University
ROBERT P. MAGEE
Northwestern University
GERALD L. SALAMON
Indiana University

Consulting Editors
JOEL S. DEMSKI
Yale University
ROBERT W. HOLTHAUSEN
University of Chicago

VOL. 65 JANUARY 1990 No. 1

RONALD A. DYE
Mandatory Versus Voluntary Disclosures: The Cases of Financial and Real Externalities
JOHN R. ROBINSON and PHILIP B. SHANE
Acquisition Accounting Method and Bid Premia for Target Firms
ROBERT LIPE
The Relation Between Stock Returns and Accounting Earnings Given Alternative Information
SARAH E. BONNER
Experience Effects in Auditing: The Role of Task-Specific Knowledge
LINDA ELIZABETH DeANGELO
Equity Valuation and Corporate Control
AMIN H. AMERSHI, RAJIV D. BANKER and SRIKANT M. DATAR
Economic Sufficiency and Statistical Sufficiency in the Aggregation of Accounting Signals
ROSS L. WATTS and JEROLD L. ZIMMERMAN
Positive Accounting Theory: A Ten Year Perspective
NOTES
JOHN A. ELLIOTT and DONNA R. PHILBRICK
Accounting Changes and Earnings Predictability
STEPHEN P. BAGINSKI and JOHN M. HASSELL
The Market Interpretation of Management Earnings Forecasts as a Predictor of Subsequent Financial Analyst Forecast Revision
ROBERT W. HOLTHAUSEN and ROBERT E. VERRECCHIA
The Effect of Informedness and Consensus on Price and Volume Behavior

Accounting and Business Research, Vol. 20, No. 80, pp. 287–298, 1990

Some Issues in Corporate Hedging Policy

S. Eckl and J. N. Robinson*

Abstract—The increased volatility of financial markets in recent years has led to a corresponding increase in the volatility of corporate earnings. This has, in turn, led to a surge of interest in hedging. At first sight, it may seem that, to the extent it can reduce volatility, hedging is a worthwhile activity. However, we argue that the issue is less clear-cut than meets the eye. In the process of developing our arguments, we shall look at some of the financial instruments available for hedging and shall show how they can be used for various hedging and non-hedging purposes.

The debate on whether or not to hedge

The literature on whether or not corporations should hedge is now quite extensive and will not be reviewed here. (Interested readers are referred to Dufey and Srinivasulu 1983, Shapiro and Titman 1985 and Smith and Stulz 1985.)

In many ways the debate revolves around the extent to which economists' models accurately reflect the real world. Thus, for example, there is an argument on whether or not corporations really have any exposure to hedge. The purchasing power parity (PPP) theory suggests that corporations have no foreign exchange exposure and therefore have no need to hedge. The Fisher interest rate framework leads to the same conclusion about interest rate exposure. However, observation shows that for long periods currencies deviate from their PPP values and thus lead to exposure. Even if currencies always moved exactly in line with PPP theory they would reflect only the price movements in a 'bundle' of goods and services making up the relevant national price index. The bundle of goods and services important to a corporation could well differ from that applicable to PPP measurements.

The argument on whether any exposure which may exist should be hedged by the corporation is similar. The capital asset pricing model (CAPM) suggests that a publicly traded corporation should not hedge. To the extent that its shareholders are free to own (parts of) other firms and other assets, the riskiness of one individual firm is unimportant. By choosing an appropriate combination of assets, owners can choose a combination of risk and return which best suits them. Thus, if exchange rate, interest rate and other economic risks are unsystematic, they can be diversified away by the investors in the process of constructing their portfolios. If these risks are systematic and if hedging instruments are priced according to CAPM, a firm which hedges just moves along the security market line and adds nothing to its value. However, once the possibility of bankruptcy is introduced hedging becomes more sensible and increases the value of the firm.

The Modigliani-Miller argument that anything a firm can do its owners can do for themselves is also similar. In the real world there are economies of scale, regulatory barriers, etc which may limit the opportunities available to the individual relative to the firms, and the managers of a firm may have more information about its activities than its shareholders.

These and other issues are discussed in detail in the context of foreign exchange exposure by Dufey and Srinivasulu (1983).

It is common practice to think of the value of the firm as the discounted value of its expected net cash flows and to assume that the firm's owners aim to maximise its value. We continue this practice.

To a limited degree, the absolute levels of a firm's net cash flows might be independent of the degree of fluctuations in those levels. That is, the better the corporation's investment decision, the stronger its product lines, the more effective its marketing, etc, the greater will the expected net cash flows tend to be, regardless of whether or not those flows fluctuate over time. However, there may be some circumstances in which this independence is not seen. For example, lenders such as banks may price their loans according to the perceived risk of default and their perception may be influenced by cash flow volatility. In this case, a reduction in volatility can reduce the cost of funds and so raise the levels of net cash flows during a period of borrowing. Similarly, a progressive tax system will lead to greater tax payments on a volatile cash flow than on a stable one. Also, adjustment costs such as changing the number of product outlets and hiring and firing costs will lead to lower cash flows under volatility than under stability. A further factor may be customer confidence. A would-be buyer of a durable asset may want to be sure that its seller will be in business during the whole life of the asset, and the volatility of the seller's cash flow may influence the degree of certainty.

---

*Stefan Eckl is a director of Chase Investment Bank Limited; Nick Robinson is Director of Economics for the Chase Manhattan Bank's Europe, Africa and Middle East Area. The authors write in a private capacity and the views expressed are not necessarily those of their employers.

At first sight, it might be thought that the discount rates used to discount the firm's expected net flows would depend upon the expected levels of the net cash flows and on the degree of certainty with which the cash flows can be estimated. It would depend on the levels because to the extent that the net cash flows represent income to their recipients low incomes will produce a high marginal utility and hence a high discount rate. It would depend on the degree of uncertainty because of the general principle that uncertain flows are discounted more heavily than certain flows.

While this may be so in certain cases, the situation with respect to a publicly traded corporation is less clear cut. If the value of the corporation, V, is captured in freely tradeable securities these securities will form part of more general portfolios. There is a strong argument from portfolio theory, and considerable empirical evidence, to support the argument that the appropriate discount rate depends only upon the securities' systematic risk, the return to the market portfolio and the risk-free rate of return. The premium over the risk-free rate of return incorporated in the discount rate should be proportional to the securities' systematic risk compared with that of the market.

Circumstances in which corporate hedging may add value

It is sometimes argued that because a firm with volatile cash flows is 'riskier' than one with stable cash flows the owners of such a firm will be interested in hedging to reduce volatility. However, it can be seen from the above that this argument is not usually correct. To the extent that the owners of the firm are shareholders who are free to own (parts of) other firms and other assets, the riskiness of the one individual firm is unlikely to be important. By choosing an appropriate combination of assets, owners can choose a combination of risk and return which best suits them. In such cases, this approach suggests that the main users of hedging would be owner-managed firms for whose owners the firm represents a large proportion of the owner's total wealth.

If we confined ourselves to a text-book world of no adjustment costs and no taxation, these owner-managed firms might be the only companies to hedge. Once we move towards the real world we find that, as indicated in the first section, the volatility of cash flows can lead to a reduction in the level of these flows and so we find several more motives for hedging, namely

—reducing spreads on loans from banks
—reducing tax payments in a progressive tax regime
—reducing adjustment costs such as hiring and firing
—improving customer confidence
—taking advantage of opportunities available to the corporation but not to shareholders, such as regulatory arbitrage opportunities, economies of scale, availability of market information, availability of 'inside' information on the corporation, etc.

Also, we have so far ignored any conflicts of interest, having implicitly assumed that owners, shareholders, managers, etc. have identical interests. It is possible that, particularly in large corporations, interests differ and different individuals may follow different interests even if, in the aggregate, their actions lower the value of the firms. Thus senior managers with future employment prospects in mind may feel reluctant to announce large changes in quarterly earnings, purchasing managers may have in their job description an instruction to stabilise input costs, and so on. These types of situation can also lead to hedging, even though hedging might not benefit the well-diversified shareholders. Some of these issues are discussed in Smith and Stulz (1985).

Practical hedging

This section can be subdivided into three parts: exposure measurement; instruments for hedging; active or passive (speculation or hedging).

Exposure Measurement

In practice, exposure measurement is far from easy. Consider the case of a relatively uncomplicated manufacturing company buying raw materials, processing them into its finished product and selling the product in overseas markets as well as in its home market. This company faces many different exposures. It is exposed to movements in: (1) The prices of its raw materials, including those resulting from a change in the international exchange price of the US dollar, the currency in which raw material prices are usually expressed. (2) The prices of the energy which it needs for processing the materials. (3) The international exchange price of its own home currency. A rise in its home currency will reduce its competitiveness in overseas markets, while at the same time making its home market more attractive to its competitors from abroad.

The company is also exposed to movements in: (4) Many overseas currencies through their impact on its overseas competitors, both actual and potential. (5) Domestic interest rates which will change the cash flows on its loans and which may also change its sales revenues if the customers for its products are also influenced by interest rate changes. (6) Overseas interest rates which might also influence the company through their impact on its overseas competitors. In short there will be several, quite complicated, links between changes in the determinants of its operating environment and changes in its performance.

The process can be shown in principle as that of measuring the first derivative of the value of the firm (v) with respect to each of the variables.

$$E_i = \frac{\partial V}{\partial_i} = \frac{\partial}{\partial_i}\left[\sum_{j=1}^{\infty} \frac{ncf_j}{(1 + {}_o r_j)^j}\right]$$

where *i* denotes the factor under consideration, such as the DM/\$ exchange rate, the six month LIBOR rate and so on, and *E* denotes exposure, i.e. the impact of a unit change in factor *i*.

Exposure measured in this way is often known as economic exposure or strategic exposure. This exposure may be quite different from either transaction or translation exposure. A company may have no foreign operations of any kind and therefore neither transaction nor translation exposure. However, a change in its host country's exchange rate will change international competitive pressure and so, via imports and exports, change its performance.

While it is useful to think of the process as a series of partial differentiations, it is also important to consider any links between the factors considered. To give one example, some observers see a link between the world price of oil and the exchange value of the pound sterling, with a rise in the former leading to a rise in the latter. In such a case, the company's exposure to a rise in the price of oil is not simply *dv/d* oil as the concomitant impact of the exchange rate must be taken into account.

The measurement of exposure is discussed at greater length in Chen, Roll and Ross (1986). Further discussion of exposure to interest rates is contained in Flannery and James (1984) and to exchange rates in Flood and Lessard (1986) and Mann (1986).

Instruments for Hedging

(a) The building block approach

The development of markets in options and swaps, together with the growth of the forwards and futures markets, provides building blocks which are the tools for managing a firm's strategic risk.

Let us look at some examples. Consider a UK based corporation whose performance is adversely affected by a rise in the US dollar. This exposure is summarised in Figure 1. The upper part of the figure shows that the stronger the exchange rate of the US dollar the worse the performance of the company (V) will be. The lower part of the figure centres the risk profile on the forward rate and shows that fluctuations above the forward rate will worsen performance relative to that seen at the forward rate while fluctuations below the forward rate will improve performance.

An obvious form of short-term protection against such exposure is the forward contract. The firm would agree today to buy the currency it needed at a pre-arranged price (the forward rate) for delivery on a pre-arranged (expiration) date. As indicated in Figure 2, the stronger the dollar on the pre-arranged date, the greater the value of the contract to buy dollars at the pre-arranged fixed price. Should the dollar's value turn out to be equal to the forward rate, the forward contract expires with a value of zero because the dollar is delivered at a pre-arranged rate which happens to be the same as that available in the spot market at that date.

Thus the combination of the underlying exposure which comes from the firm's core business–

Figure 1

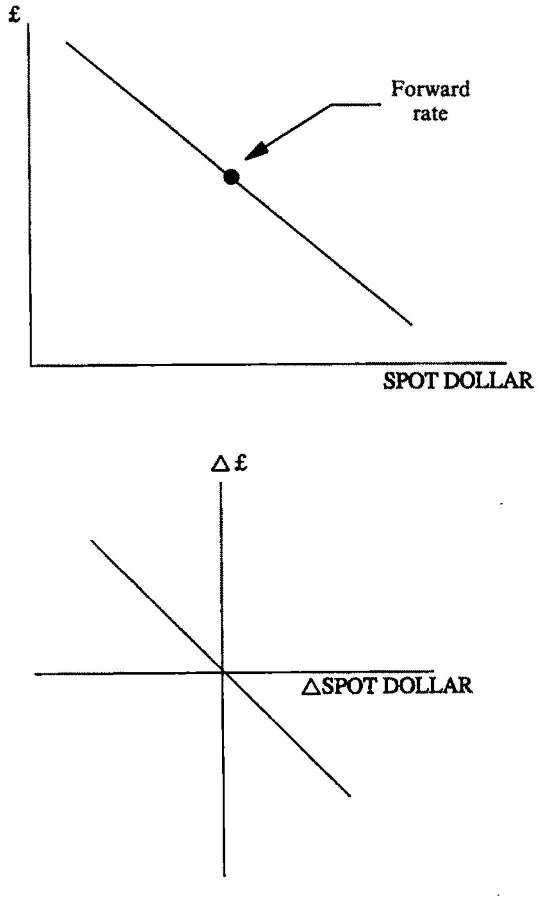
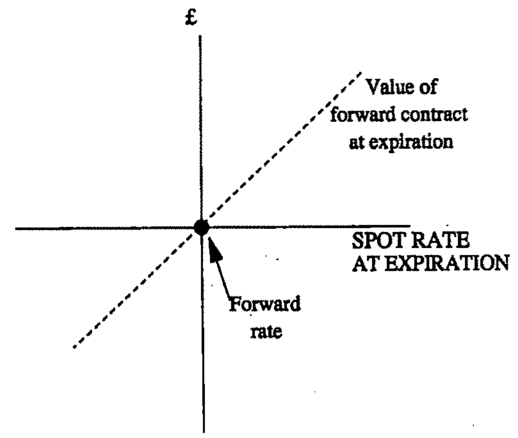


Figure 2



the business of importing–and its foreign exchange contract is unaffected by exchange rate movements because, as the stronger dollar reduces the profits from importing, so the greater value of the forward contract offsets the reduction in profits. The firm's exposure profile has been changed into a horizontal line, indicating the removal of exposure, as shown in Figure 3.

What can be done for foreign exchange exposure can be done for other exposures too. Hence the company's interest rate exposure can be hedged with an FRA (Forward Rate Agreement), thus providing the same certainty of outcome for interest charges as the currency forward did for foreign exchange costs.

Longer-lasting exposures can be hedged in a similar way through the use of currency interest rate swaps. Even commodity price exposures can be hedged nowadays, through the use of commodity-indexed instruments.

This type of hedging removes all exposure in the sense that the company's cash flow at one or more future dates can be fixed today. It is also possible to tailor exposure to suit individual requirements. To illustrate this, let us reconsider the case of the manufacturer who suffers from a rise in the dollar. A forward or a swap protects him from a rise in the dollar, as shown in Figure 3. The trouble is that, should the dollar weaken rather than strengthen, the manufacturer will find the forward contract worsening his performance. The forward hedge has worked against him and he would have done better not to have hedged at all! Now let's think of the use of a call option on the dollar. This gives its owner the right but not the obligation to buy a specified quantity of a currency at a specified price and time. The results of using an option are shown in Figure 4. The right hand side of the picture looks quite attractive, but for many potential users the left hand side is less so. The price of the option is high enough to offset some of the benefits from a weaker dollar. To many potential users the price seems so high that options do not feature on their shopping list.

Increased familiarity with options and other building blocks of financial engineering shows how 'value-for-money' solutions can be found. The exercise price of a call option is an important determinant of its price. The higher its exercise price the cheaper the call option will be. The option user shown in Figure 4 seeks to protect himself from even the smallest adverse movement of the exchange rate from the forward rate prevailing when the option was bought. However, not every potential user will want so powerful, and therefore so expensive, an insurance. Many are well able to live with small movements in rates and want to guard against only the larger adverse movements. To do this, they use an option with a higher exercise price than the forward, as shown in Figure 5. A comparison between Figure 5 and Figure 4 shows that the second option is cheaper than the first, so that the changed exposure profile shown by the broken line lies closer to the original exposure shown by the solid line.

Now we are beginning to see how to explore value for money. To reduce the up-front cash cost of protection even further, buy a call option and sell a put option with exercise prices chosen so that the two options have equal premia. We now have an instrument with several proprietary names: the range forward, the tunnel, the zero-cost option, the collar, the floor-ceiling swap, the cylinder, the forward band etc. This instrument, which involves no cash outlay, removes all the downside exposure beyond a predetermined point (determined by the exercise price of the call option) and pays for this removal by eliminating all the upside exposure beyond a different point (determined by the exercise price of the put option). In the middle range the exposure remains (Figure 6).

Figure 3

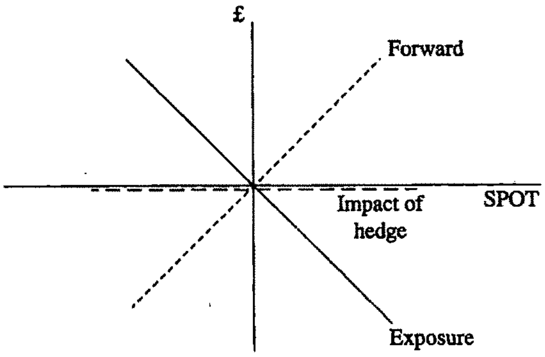
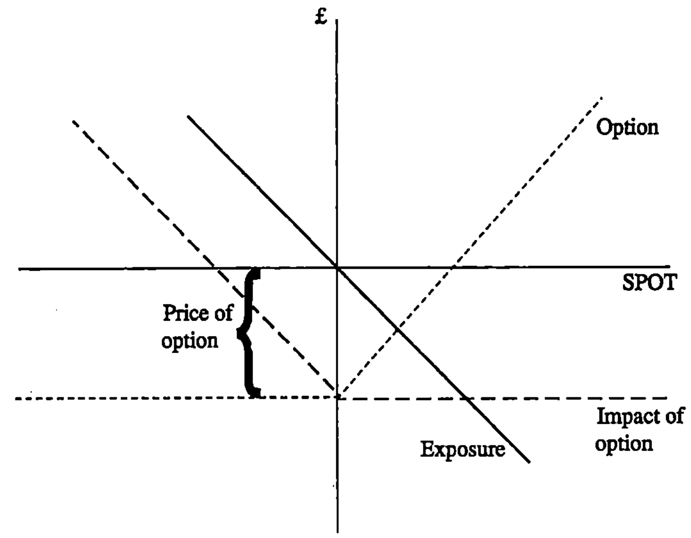


Figure 4



But this solution may not suit the corporation perfectly. An alternative is to take the same call option once again and consider selling a put with the same exercise price and on the same amount as the call. The call is out of the money and the put is in the money. Thus, pound for pound or dollar for dollar the put is more valuable than the call. To produce equal premia, the put must be written on a smaller amount than the call and so it will have a smaller adverse impact on the corporation should it be exercised against it. This put-call combination, known as a participation or a profit-share option, involves no cash outlay yet gives protection against the downside, while leaving a share (with no upper limit) in the upside (Figure 7).

The potential list is enormous. If needs and opportunities can be properly specified, it is usually possible to put together a combination of financial building blocks which will satisfy the needs and take advantage of the opportunities. What can be done for foreign exchange exposure can also be done for interest rate exposure and, to an increasing extent, for commodity price exposure. These issues are discussed at greater length in Robinson (1989a).

Figure 5

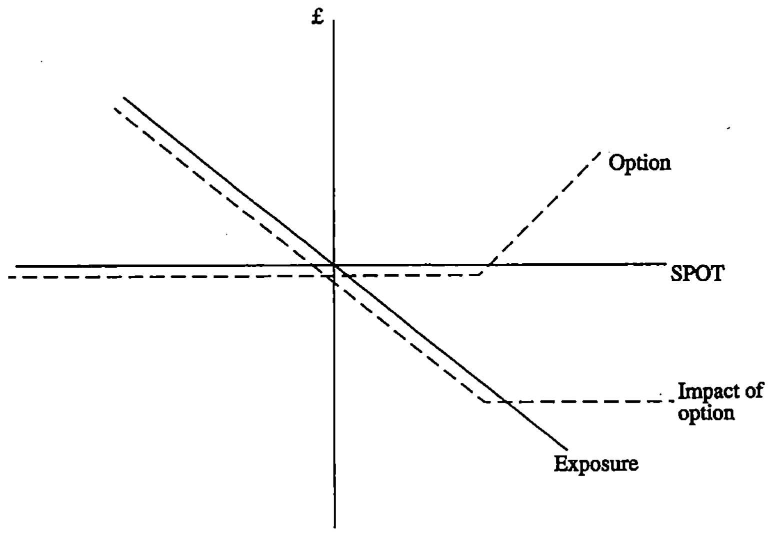
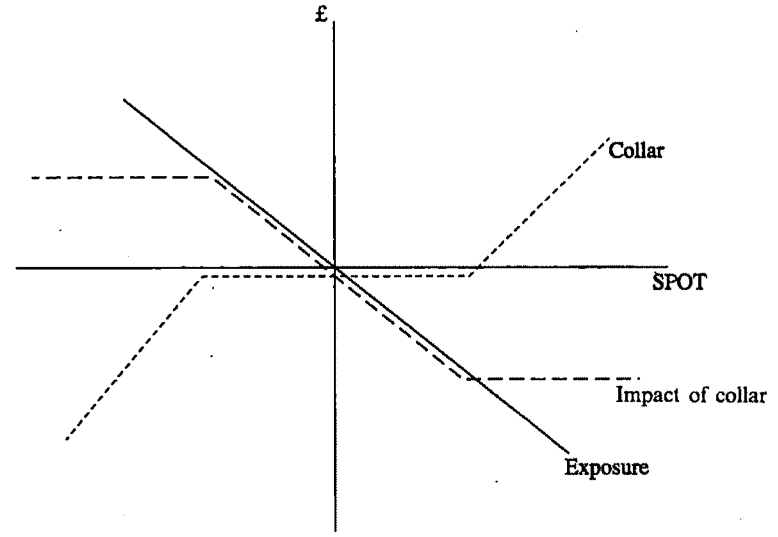


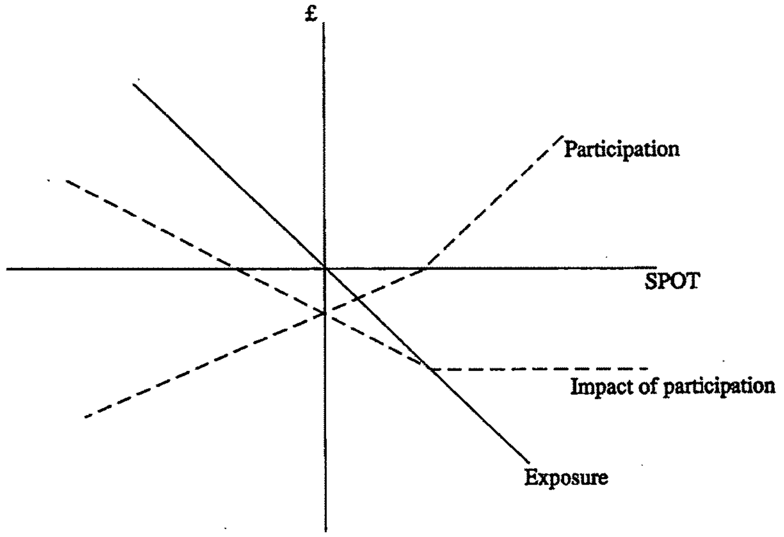
Figure 6



(b) The insurance approach

Another and powerful way of looking at the building blocks and the shapes which can be engineered from them is to view them in terms of insurance. This view shows from a different perspective how they form part of a single family. Start with the forward contract. This is a 'cheap' product, costing, for the most credit-worthy customers, a very small percentage of the underlying quantity. It is 'cheap' because it locks in a guaranteed, fixed, exchange rate in the future. In other words, an insurance is bought which removes all the downside risk and it is paid for by selling all the upside risk. The purchaser of the forward contract will gain should the spot rate move in his favour but will lose, equally and symmetrically, should the spot rate move against him. Given that actual spot rates tend to follow a normal distribution centred on the forward rate, it is not surprising that the two parts of the contract have roughly equal and opposite value, thus producing a 'cheap' product. In a similar way, futures and swaps are also 'cheap'. A single option, which can remove the downside

Figure 7



while leaving the upside, is correspondingly 'expensive'. Hence the put-call parity theorem—a put option with a premium equal to the premium of a call option with an exercise price equal to the forward rate, will also have an exercise price equal to the forward rate. The cost of removing all the downside risk is giving up all the upside potential.

However, once a user is prepared to accept some of the downside risk and to remove only the more extreme cases (an insurance with a deductible) some of the upside remains. There is then a large variety of ways in which that upside can be enjoyed, as shown in our figures. Figure 5 shows the use of a single, out of the money, call. With this call all the downside is removed beyond a chosen point and all the upside can be enjoyed except for a constant deduction required to pay for the option (the option premium). Figure 6 shows a 'zero cost' cylinder which removes all the downside beyond the chosen point but which pays for this insurance in a different way. Instead of a fixed premium the cylinder allows the user to enjoy all the upside up to a certain point but none thereafter. Figure 7 shows the downside protection paid for by giving up a proportion of any upside gain and so on. The user can choose between these possibilities depending upon his or her objectives and views about likely future movements in rates. These issues are discussed at greater length in Robinson (1986b).

Active or Passive: Speculation or Hedging?

We have not so far considered the price of the instruments available for hedging. In general, the price to a purchaser will be made up of three parts: the underlying central price, the bid-offer spread and any other transactions costs and the charge for credit risk. Consider a one year currency forward contract under which the buyer is obliged to provide, for example, DM 1.8 million in return for US$1.0 million. The figure of DM 1.8 million is arrived at by calculating the central forward rate for DM/$ (which is in turn a function of the spot rate and the spot interest rates for a one year maturity in each of the currencies), adding the seller's spread and then adding a further amount to take account of the risk to the seller that the buyer will be unable to provide the $1 million when the contract matures. In what follows we shall ignore credit risk (thus implicitly assuming that the buyer falls into the best possible credit rating category). For the time being, we shall also ignore bid-offer spreads (thus implicitly assuming that transactions costs are zero). Given these simplifications the exchange rate written into the forward contract will be the forward rate for the currencies concerned.

As discussed in the previous section, the payoff to the buyer of the forward contract at expiration will depend upon the difference between the rate in the contract and the spot rate at expiration multiplied by the amount on which the contract is written. Applying this to our example shows that payoff as DM1 (S – 180) million, where S denotes the spot rate at expiration.

There has been a considerable amount of research which suggests that, in liquid markets with no institutional constraints, the forward exchange rate is an unbiased predictor of future spot rates. If this is so, the expected value of the payoff to a forward contract will be zero. To put matters in another way, the process of repeatedly hedging over a fixed period could be expected to generate zero profits and, given enough repetitions, would actually produce zero profits.

It follows from this that, if hedging with forward contracts is to produce a profit, the hedger must be able to outperform the forward rate. That is, the buyer must at least once either identify a period in which the spot rate will turn out to be lower than the forward rate and leave the period unhedged or identify a period in which the spot rate will turn out to be higher than the forward rate and hedge for a sum greater than his underlying exposure. Believers in the efficiency of markets would argue that such an ability is very rare indeed.

We have begun the discussion of these issues in terms of currency forward contracts. However, the same issues apply in other markets and to other products. Interest rate forward contracts (FRAs) also have forward rates written into them. Research suggests that forward interest rates are unbiased predictors of future spot interest rates. Thus profitability hedging interest rate exposure with interest rate forwards also involves outperforming the forward.

Futures and swaps, whether on currencies or on interest rates, also embody forward rates in their prices. Options, too, involve the same issues. The payoff at expiration to the holder of an option can never be negative, but the premium which must be paid for the option is meant to reflect this. The expected value of buying a fairly priced option and holding it to expiration is zero. Repeated hedging with options will produce no greater profits than repeated hedging with the other three instruments discussed in the previous section.

Let us briefly sum up the argument so far. What we are claiming is that using hedging of the kind just outlined is unlikely to yield profits. That is, the hedging activity *per se* will not be profitable. That is not the same thing at all as claiming that hedging is useless. In the circumstances outlined in the section second above, hedging will improve the overall value of the firm and will therefore be well worthwhile. However, in those circumstances, hedging is worthwhile because it leads to reductions in cash outflows rather than because it contributes directly to profits. The hedger should use instruments which are simple to administer and account for, and should hedge his exposure for as long as it will be seen or for as long as it can be predicted with any accuracy. If instruments of long enough maturity are unavailable (either in the market or through synthetics) the more distant exposure cannot be perfectly hedged.

Somehow, though, this approach seems at odds with casual empiricism which suggests that a great deal of very active and successful hedging and speculation is going on. There are several possible reasons for this. First, forward rates are far from accurate predictors, even if unbiased. Over limited time periods, many other forecasting methods will perform better than the forward and the search for, and application of, these methods may drive many of the users of hedging instruments. There may be occasions where even though the brain accepts the efficient markets view of the world, the heart does not. For example in February 1985 both spot and forward rates showed the dollar close to parity against the pound sterling. To many people the gross relative overvaluation of the dollar seemed unsustainable and some large positions were taken as a result. Conversely, in late 1980 and early 1981, when the dollar traded in spot and forward markets close to 2.40 against the pound, its relative undervaluation was seen as unsustainable. Many participants in the market acted upon these feelings and used financial instruments such as currency forwards to 'lock in' a rate close to 2.40, often with some success. In these situations, some lessons can be drawn for the use of different hedging instruments. For a company highly exposed to the $/£ exchange rate due to large exports from the UK, locking in the 1985 dollar rate with forward contracts would have guaranteed a high profit margin. In 1988, with a strong pound, the use of forwards would have meant locking in a smaller profit or possibly a loss—at this end of the cycle the use of options is more advisable.

Although reports of successful hedging abound, we should retain a reasonable degree of scepticism. The fallibility of human nature and memory may play a part here. Asked about their past performance hedgers may well tend to remember their successes rather than their failures!

Sampling techniques may be defective. Successful hedgers may retain their jobs while unsuccessful hedgers are quickly moved on. A sample of current hedgers whose records can be examined may therefore contain a disproportionate number of successful hedgers and so be unrepresentative of the whole population.

Finally, the criteria of success may be incorrect, with correct or good prediction being confused with outperforming the market. Thus, after a period in which interest rates have fluctuated greatly a hedger may point to his success in anticipating the movements up and down and in changing the interest sensitivity of his loans or deposits accordingly. However, to the extent that the actual rates corresponded to the forward rates implied in the yield curve this active hedging policy has achieved nothing. Similar results would have been obtained from fixed rate loans or deposits arranged at the start of the period and left untouched until the end.

Some other uses of hedging instruments

Many of the instruments which can be used for hedging can also be used for other purposes. As time has gone by and as users of the instruments have gained greater experience of them, so the users have discovered more and more different uses. Financial instruments turn out to be very versatile. Developments in this area have been classified by the Bank for International Settlements (1986) and Cooper (1986). In the last section, we give an example of each of the major uses of the instruments. A more detailed discussion of these issues is contained in Eckl, Hampton and Robinson (1987).

Exploiting Exposure Profiles

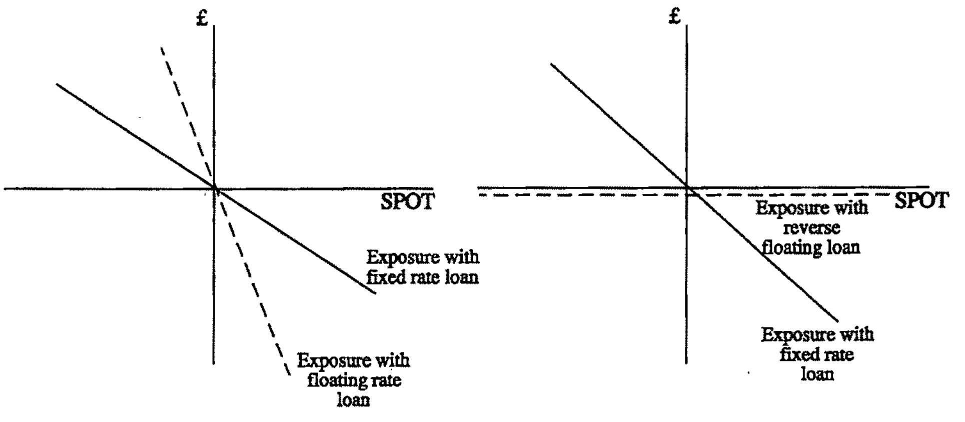
Many institutions—for example sellers of consumer durables or property developers—find that, because of their customers' sensitivity to interest rates, their sales revenues are reduced when interest rates rise. Hence if they finance their operations by means of an ordinary floating rate loan they are doubly exposed, with their debt servicing costs rising just as the income available for debt servicing falls. At first this may seem an unfortunate, but insoluble, problem. However, many banks now offer reverse floating loans whose charges are inversely related to market interest rates. A loan agreement, under which, for example, a borrower pays 18% minus LIBOR rather than LIBOR, provides the required matching of costs and ability to pay and so removes interest rate exposure. This is illustrated in Figure 8. Innovative as a reverse floating loan may seem, it is no more than an ordinary floating loan coupled with a fixed-floating interest rate swap whose notional principal is twice that of the loan amount.

To give another example, some time ago the price of oil fell below ten dollars per barrel thus forcing an oil company to increase its borrowings. However, because the lower oil price reduced the company's credit rating it found itself being asked to pay higher interest charges just at the time it needed the money! This problem was solved by issuing a bond which paid the larger of either 11% per annum (where 11% was considerably below the rate which the company would normally have to pay) *or* the value of one half of one barrel of oil per $100 borrowed.[1]

---

[1] The full details of the deal were more complicated than shown here, but its essence is captured in this simplified illustration.

Figure 8

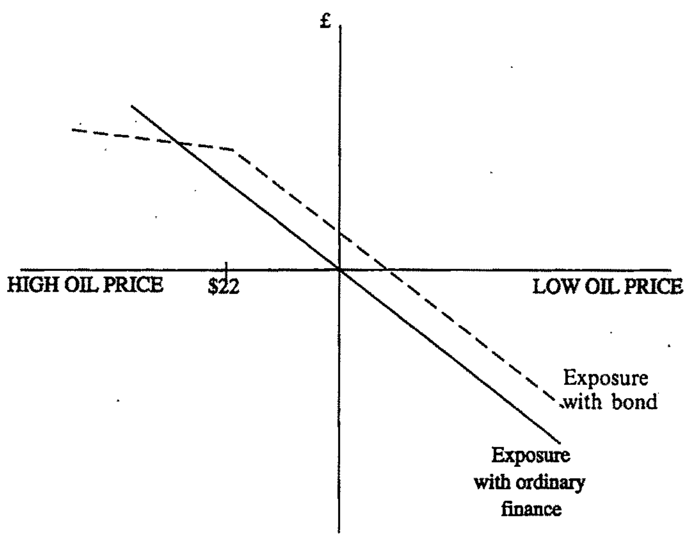

£
SPOT
Exposure with fixed rate loan
Exposure with floating rate loan
£
Exposure with reverse floating loan
SPOT
Exposure with fixed rate loan

Under this arrangement, the company sold to the bond holders call options on oil whose value was reflected in the lower 'subsidised' coupon rate. By doing this, the company matched its costs to its ability to pay. Should the oil price remain below $22 per barrel and the company therefore remain relatively badly off, it would continue to pay an exceptionally low rate of interest. Should the oil price rise above $22, the company would pay higher interest rates, but the company would also be cash rich and well able to pay these rates. Figure 9 serves to illustrate this arrangement.

In the exchange rate context, a further example of this kind of management is a Currency Conversion Facility (CCF), sometimes called a Dual Currency Loan. Under this facility a borrower takes out a loan and simultaneously gives the lender the right, at a pre-determined future date, to convert the loan into a specified alternative currency at a pre-determined exchange rate. The value of this currency option is passed on to the borrower in the form of a 'below-market' interest rate. Thus the *possibility* of higher payments in the future, should the option be exercised, is accepted in order to gain the *certainty* of lower interest charges today.

This arrangement is attractive to borrowers who have liabilities in one currency (the dollar, say) and assets in another (the DM, say). By borrowing dollars, convertible to DM, the borrower can raise funds at a lower cost today. If the dollar falls against the DM, the option will be exercised and

Figure 9



CALCUTTA CENTRAL LIBRARY

some of the benefit from the weaker dollar will be lost because the cost of the loan will then be higher than it would have been otherwise. At the same time the DM assets will have increased in value, so the borrower would still be better off. To show the situation another way, think of a borrower's performance measured on a scale of 0 to 10. Today's circumstances have pushed some heavily indebted borrowers down to 3. As the dollar falls they will move up again, say to 8. By entering into a CCF today's performance can be raised to 4, at the cost of rising to 7 rather than 8 should the dollar fall. Many borrowers would find a certain 4 today and a possible 7 in the future preferable to a certain 3 and a possible 8. Figure 9, with oil prices replaced by the DM/$ exchange rate, would serve to illustrate a CCF arrangement.

Of course, each of these uses can be reversed to make similar changes to rates earned by depositors, rather than to rates paid by borrowers.

Time and Tax Transformation

In some cases, it is possible to use the building blocks of financial engineering to transform cash flows over time. An example would be an off-market swap. Consider an ordinary 'plain vanilla' swap. Normally the swap is arranged initially so that the net present value of the expected payments on the one side of the swap is equal to the net present value of those on the other side. This way, apart from transaction costs, no money changes hands at the time when the swap is set up. However, if one side is set above (or below) the current market rate, the expected future cash flows will have different present values so that the payer will receive (or pay) cash at the time when the swap is set up. This way, provided the tax regulations permit it, a company which currently faces a low rate of tax but which expects a higher rate in the future may enter into an off-market swap, which gives it a cash inflow today while increasing its cash outflows in the future. By transforming the time profile of its flows the company has reduced its tax liability. Similar results can be obtained by selling (buying) in-the-money call options and buying (selling) out-of-the-money put options.

Even the simple forward contract can be used to transform cash flows and tax liabilities. For example, country A's interest rates may lie 10% below country B's. This may encourage borrowers in country B to borrow country A's currency and so enjoy lower interest rates. However, this would leave them exposed to exchange rate movements which might more than offset the interest rate gain. This risk can be removed by buying country A's currency forward but, in general, the forward rates will reflect the interest rate differential and so raise the cost of borrowing A's currency until it is equal to that of borrowing B's. However, the pattern of the cash flows will be different.

For example, a fixed rate loan in B's currency will involve constant, high, interest payments, followed by the repayment of principal at par. A fixed rate loan for the same amount denominated in A's currency and covered on the forward market will involve initially low, but rising, interest payments, followed by a repayment larger than the initial principal. The difference in the two cash flows may make one type of loan preferable to the other, while tax allowances or different tax treatments of interest and capital may again make one loan preferable to another for the borrower and/or the lender.

Interest Rate Protection and Affordability

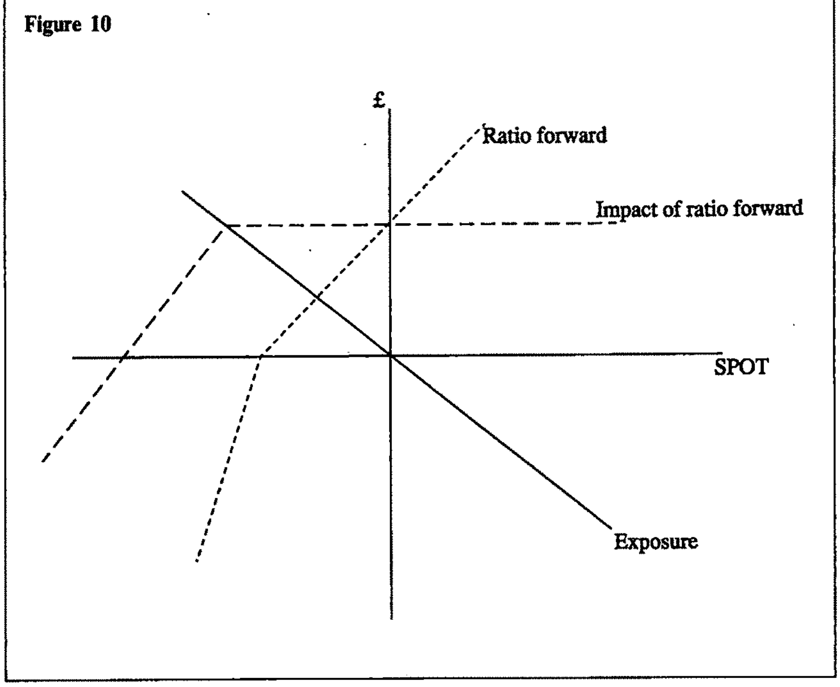
A leveraged buy-out group acquired several chemical facilities on a highly leveraged basis. A bank was lead manager and agent for the $750 million bank-financed portion of the transaction, which was provided on a floating rate basis. Increases in interest rates could have had a devastating effect on the results of this new venture. The dilemma was how to obtain protection against rising rates without incurring burdensome protection costs.

The bank worked with the client to perform extensive simulation analysis to determine the potential tradeoffs between cost and risk. The resulting solution was to execute a series of amortising increasing strike interest rate caps with increasing strike prices. The amortisation schedule was set to match the underlying debt while the cap strikes were set to provide greater protection in the early periods where it was needed most and progressively less as the firm was able to withstand more risk. The result was an exposure arrangement structure, tailored to suit the requirements of the company's management exactly.

Rescuing the Budget

A corporation drew up its annual budget on the assumption of a rather favourable exchange rate. Almost immediately the spot and forward rates moved unfavourably and stayed much worse than the budget rate. The corporation was able to achieve its budget rate after all by using a combination of put and call options known as a ratio forward. Under this combination a deeply in-the-money call option is bought to provide the necessary pick-up over the forward rate to move back to the budget rate. The call is paid for by selling a put option with the same exercise price. As this put option is out-of-the-money, it will have a lower premium than the equivalent call option. In order to make the premia of each option equal the put must be written on a larger quantity than the call, thus producing the pay-off shown in Figure 10.

Figure 10



Funding Cost Reduction Through Currency Diversification

A major US corporation was evaluating its capital structure in order to find opportunities for reducing its overall cost of capital. Through discussions with its bank it decided to assume some additional risk to achieve significant savings in funding cost. One alternative was to transform existing US dollar debt into a low coupon foreign currency liability.

The bank assisted its client in obtaining and analysing historical market rate information in order to assess the strategic tradeoffs. Given the immediate savings, high break-even protection and prospective exchange risk based upon historical levels, the firm decided to execute a currency swap, transforming an existing US dollar fixed-rate amortising term loan to a Swiss franc liability. The bank provided an off-market currency swap that was customised to match exactly the rates, dates and amounts of the term loan, sparing the client any residual risk of mismatched dollar flows and achieving its client's overall funding objective.

Conserving Cash Flow While Fixing Funding Levels

An offshore bank was utilising short-term Eurodollar funding as its most efficient source of financing. An important objective of the bank was to generate fixed-rate funding for asset/liability management purposes but at the same time to generate as much positive cash flow as possible through high spreads afforded by prevailing low short-term rates. The dilemma facing the bank was how to achieve both objectives, particularly when rates were expected to rise and remain high, making a conventional option structure, such as a cap, relatively expensive. The bank bought a deferred swap with an effective date two years after the commitment date but with an advancing option permitting the bank the flexibility to begin the swap earlier should rates rise. The result was the creation of a risk management structure that was tailored to the client's outlook and needs, providing the amount of protection desired in a cost-efficient manner.

Reducing Posted Borrowing Rates

A company which could be expected to pay a rate equal to LIBOR on its borrowings asked its bank for suggestions on how to reduce the posted rate. The bank was able to propose three kinds of sub-LIBOR borrowings. It showed how borrowing in a different, regulated market, then adding a swap to convert the loan back into the company's desired market, could reduce posted rates by thirty basis points per annum. It showed how the addition of warrants to an otherwise ordinary bond could produce a twenty five basis points reduction. Finally, it came up with the solution preferred by the customer—a reset swap (under which interest is paid according to the rate pertaining at the end, rather than at the beginning, of each maturity period) which gave a reduction of fifty basis points compared with an ordinary, plain vanilla swap rate.

As with their use in hedging, the list of non-hedging uses for financial instruments is long and growing. The growth of financial engineering which has been seen in recent years probably owes as much to the instruments' use for purposes other than hedging as to their use for more traditional hedging purposes.

Conclusion

In this paper we have looked first at the situations in which it might be sensible for a corporation to hedge its exposure, and some of the financial instruments available for hedging and how they can be used. Next we considered the returns to hedging and suggested that profitable hedging requires the hedger to beat the market. As a result most hedgers cannot expect to do more than break even on their hedging activities. Finally, we reconsidered some of the financial instruments and showed how they could be used for purposes other than hedging. This versatility of use probably explains a great deal of the growth of financial engineering which has been seen in recent years.

References

Bank for International Settlements (1986), *Recent Innovations in International Banking* (Basle).

Chan, N-F., Roll, R. and Ross, S. A. (1986), Economic Forces and the Stock Market, *Journal of Business*, Vol 59, No 3.

Cooper, I. (1986), Innovations: New Market Instruments, *Oxford Review of Economic Policy*, Vol 2, No 4.

Dufey, G. and Srinivasulu, S. L. (1983) The Case for Corporate Management of Foreign Exchange Risk, *Financial Management*, Winter.

Eckl, S., Hampton, M. and Robinson, J. N. (1987), *Financial Engineering: Using the Building Blocks*, Chase Manhattan Bank, Working Papers in Financial Risk Management, No 5.

Flannery, M. J. and James, C. M. (1984), The Effect of Interest Rate Changes on the Common Stock Returns of Financial Institutions, *Journal of Finance*, Vol 39, No 4, Sept.

Flood, E. and Lessard, D. R. (1986), On the Measurement of Operating Exposure to Exchange Rates: A Conceptual Approach, *Financial Management*, Spring.

Mann, C. L. (1986), Prices, Profit Margins and Exchange Rates, *Federal Reserve Bulletin*, Vol 76, No 6, June.

Robinson, J. N. (1989a), Financial Engineering Products, in B. Antl (ed), *Management of Currency Risk, Vol 1* (Euromoney Publications).

Robinson, J. N. (1989b), Financial Engineering Products: Applications, in B. Antl (ed), *Management of Currency Risk, Vol 2* (Euromoney Publications).

Shapiro, A. C. and Titman, S. (1985) An Integrated Approach to Corporate Risk Management, *Midland Corporate Finance Journal*, Summer.

Smith, C. and Stulz, R. (1985), The Determinants of Firms' Hedging Policies, *Journal of Financial and Quantitative Analysis*, December.

Accounting and Business Research, Vol. 20, No. 80, pp. 299–305, 1990

Standard Setting for the Financial Reporting of Religious Business Organisations: the Case of Islamic Banks

Rifaat Ahmed Abdel Karim*

Abstract—Islamic banks have to abide by Islamic principles in all their business transactions. Accounting practices also have to be in conformity with this cardinal rule. Currently almost every Islamic bank sets its own accounting policy through a process which involves in-house religious advisers and the financial auditor of the bank. However, Islamic banks have recently agreed to establish a standard setting body to regulate their financial accounting and reporting. This paper argues that one of the predominant factors which seems to have influenced this decision and the institutional arrangements through which accounting standards will be promulgated is Islamic banks' fear of possible future intervention by their regulatory agencies.

The Canon Law of the medieval Christian Church and Islam entertain similar beliefs as regards business activity. Both faiths do not recognise any separation between economic and spiritual affairs, and consider trade and industry as a matter of morality and subject to revealed doctrines. For example, Islam prohibits usury as did medieval Christian Europe. De Roover (according to Parker 1988) considers some of the practical accounting effects of the latter's ban on usury and shows how merchants, at that time, invented a number of ways to circumvent the ban. However, it is only in the last three centuries or so that Canon Law has been unable to exercise much control over 'the rise of capitalism', and Western Europe developed the dichotomy between its economic life and its spiritual life, which was the subject of commentary by Weber (1904–05) and Tawney (1926), among others.

On the other hand, although Islam contains very extensive and specific rules for the conduct of business affairs, there has never been a period in modern history when they have been allowed to function as the normal methods of business. However, a number of countries are currently proposing to apply these directives, in full, to the control of their economic affairs. This movement is based upon a renewed belief that this largely untried system is a revelation of eternal truth, and will work. One of the major economic developments of this resurgence of the Islamic faith is Islamic banking.[1]

Islamic banks are now operating in many parts of the world and particularly in the Middle East and Asia. These banks are established as an alternative to traditional commercial banks to provide financial services to Muslims who are keen to adhere to their religious teachings in their business dealings.[2] The *Shari'a*,[3] which governs the operations of Islamic banks, categorically prohibits, among other things, the earning or payment of *riba* (translated strictly as usury, but interpreted universally as interest) in all financial transactions.

As an alternative to interest, Islamic banks use various mechanisms in their mobilisation and uses of funds. Two of these mechanisms (*Musharaka* and *Mudaraba*) are based on the concept of profit and loss sharing while the others are similar to cost plus margin of profit (*Murabaha*), lease financing (*Ijara*) and hire-purchase financing (*Ijara-wa-igtina*).[4]

The measurement, recording and reporting of business transactions which are carried out through these mechanisms tend to differ from what is advocated by Western generally accepted accounting principles (Banaga 1987; Hashimi 1987), and from one Islamic bank to another.[5] The differences in the former focus on the economic substance of business transactions and the information requirements of users of financial statements.

---

*The author is assistant professor of accounting at Kuwait University. He acknowledges the helpful comments of Lee Parker and the reviewers.

[1] See Gambling and Karim (forthcoming) for a discussion on the revival of Islam and modern business activity and its effect on the development of accounting theory.

[2] Non-Muslims can also benefit from the services of Islamic banks.

[3] Shari'a is the source of guidance for Islamic precepts. It is the Islamic law of human conduct derived from the *Quran* (the Muslim's Holy Book) and the Sunnah (the deeds and sayings of the Prophet Mohammed).

[4] For more details on these mechanisms see Karim and Ali (1988).

[5] These differences were highlighted in a report prepared for the follow-up committee which was established by Islamic banks to look into the various alternatives of how to develop appropriate accounting standards.

On the conceptual level, the prohibition of interest means for some Muslim scholars (e.g. Abu Saud 1976) that the concept of the time value of money is not acceptable in Islam. Others (e.g. Tomkins and Karim 1987) do not share this view and believe that the discounting of cash flows does not constitute any violation of the *Shari'a*.

Recently, Islamic banks have decided to establish a body to promulgate standards which would regulate their financial reporting. Indeed, serious steps have already been taken to start this process and a standard setting body to set accounting policy for Islamic banks is expected to become operational in the next few years. Perhaps this will be the first standard setting body to be established by religious business organisations in different countries to regulate their financial information. However, whether this body would be able to make Islamic banks abide by the standards it will promulgate, remains to be seen. On the other hand, the establishment of such a standard setting body should have far-reaching implications on the efforts of those concerned with the international harmonisation of accounting standards.

This paper examines the institutional arrangements by which Islamic banks have and may set their accounting policies before and after the proposed regulation of their financial accounting and reporting. The paper argues that the possible intervention of regulatory agencies seems to be one of the predominant factors which have influenced both the decision of Islamic banks to regulate their financial accounting and reporting, and the institutional arrangements through which this process will be carried out.

The next section outlines how Islamic banks currently set their own accounting policies. The penultimate section discusses the characteristics and determinants of the proposed standard setting body and the concluding remarks are stated in the final section.

Setting of current accounting practices of Islamic banks

Islamic banks employ in-house religious advisers—commonly known as the Shari'a Supervisory Board (SSB)—to assure consumers of their services that they are adhering to the precepts of the *Shari'a*. At the end of the financial year, these advisers issue a special report which is published with the external auditor's annual report. The report is meant to assure users of financial statements that the bank has complied with Islamic principles in all its financial transactions.

The duties of the SSB lie in three main areas, namely ex ante auditing, ex post auditing and the checking of the calculation and payment of *Zakah*[6] (see Briston and El-Ashker 1986; Karim 1990). In addition to these duties, the SSB also advises the financial auditor (and the management) of the bank on the accounting treatment of issues which require departure from generally accepted accounting principles in order to comply with the *Shari'a*.

For example, the preparation of financial information for *Zakah* purposes would mean that current assets like inventories and marketable equity securities should be valued on the basis of net realisable value. No allowances for doubtful debts would be deducted since no debt can be excluded from the base on which *Zakah* is calculated until it is established that it cannot be collected (Al-Qaradawi 1981). In addition, no consideration could be given to the lower of cost or market values of these two current assets. However, unrealised profits resulting from the differences between their cost and market values would be recognised. All leasing contracts would be treated by the lessee as operating leases and hence excluded for *Zakah* purposes. This is because funds subject to *Zakah* should be owned.[7]

On the other hand, only realised profits would be considered when determining the income to be distributed to shareholders and owners of investment and savings accounts.[8] The profit distributed to the latter two types of accounts would be considered as part of profit appropriation and not as an 'above the line' item.

At present, almost every Islamic bank sets its own accounting policy. This process, which is based on deliberation between the SSB and the external auditor of the bank, focuses on whether the accounting principles enforced in the country in which the bank is operating violate the precepts of the *Shari'a*. Accordingly, business transactions are measured, recorded and reported according to the latter whenever departure from the prevailing accounting principles is necessary. Nevertheless, the annual reports of many Islamic banks tend to lack adequate disclosure of their accounting policies and do not reveal whether these policies differ from the accounting principles governing the banking sector.

---

[6] *Zakah* is alms giving and it is a duty on all Muslims to pay it. It is distributed to a group of eight specific classes of more or less relatively poor. Its amount differs according to the type of business. For example, in trade (which includes Islamic banks) it is levied at the rate of 2.5% while in industry the rate is 10%. Islamic banks pay *Zakah* on behalf of their shareholders and disclose the amount in their annual reports.

[7] See Gambling and Karim (forthcoming) for more details on the implications of the *Shari'a* on the financial statements.

[8] Owners of these accounts deposit their funds with the bank to be invested on their behalf. They are not guaranteed any predetermined rate of return. Rather, they share in the profits and losses which the bank incurs. However, unlike shareholders, they do not have control over the management of the bank (see Karim and Ali 1989 for more details). It is interesting to note that in 1984, Kuwait Finance House, the largest commercial Islamic bank, did not distribute any profits to owners of savings and investment deposit accounts or to its shareholders.

However, the current process of setting accounting policy (which appears to be implicitly approved by the regulatory agency concerned in each country) has resulted in a variety of accounting practices within Islamic banks and between them and other business organisations which follow Western or international financial accounting standards. Although the latter type of difference is expected given the moral principles which govern the operations of Islamic banks, the dissimilarities in financial reporting within Islamic banks are worthy of explanation.

The setting of accounting standards with reference to the *Shari'a* does not necessarily mean that Islamic banks would be adopting similar accounting policies. For example, some banks (e.g. Kuwait Finance House) use the accrual basis of accounting while others (e.g. Bank Islam Malaysia) use the cash basis of accounting. The former bank uses the lower of cost or market rule to value inventories while the latter uses only the historical cost.

On the other hand, some banks (e.g. Faisal Islamic Bank-Sudan and Jordan Islamic Bank) follow an accounting policy which specifies that shareholders alone bear all the administrative expenses while savings and investment depositors only share in the expenses related to the investments of the bank and partake in all earnings except those generated from normal banking services. Other banks (Kuwait Finance House and Tadamon Islamic Bank) do not separate the funds of the shareholders and depositors. Rather, the revenues and expenses of the bank are pooled and the residual is shared by both parties in accordance with their respective share of funds.

These differences are mainly due to the fact that the principles of the *Shari'a* are broad enough to accommodate more than a single interpretation. However, this does not include specific matters (e.g. prohibition of usury and gambling) for which there are definitive rulings. Hence, the advice provided by the SSB to the external auditor would differ from one Islamic bank to another depending on the interpretation by each bank's SSB of the principle governing the transaction.

Nevertheless, similarities do exist in the financial reporting of Islamic banks. Newly established Islamic banks tend to borrow from the accounting practices of the old ones, particularly if certain accounting policies have become popular among Islamic banks. In addition, if an Islamic bank belongs to one of the two large groups of Islamic banks, namely Al-Barka and Faisal, then it may follow the group's accounting policy if there is one available.

The present state of each Islamic bank developing its own accounting policy has parallels to the era prior to the regulation of corporate financial reporting in the USA. Like the present practice of Islamic banks, financial accounting and reporting in the USA at that time was dominated by a laissez faire attitude (Hendriksen, 1977), in which firms and auditors were expected to exercise their own best judgment in choosing appropriate financial accounting practices. Furthermore, like the present practice of Islamic banks, the financial reports of American business corporations at that time were characterised by a variety of accounting practices and inadequate disclosure (*ibid.*).

However, despite the above parallels, the process of each of the two (Islamic banks and USA) accounting practices has been different. In the case of the USA:

> the initiative of choosing accounting methods was in the hands of the clients of auditors (i.e. management), with few restrictions placed on their choices (Gaa, 1988, p. 8).

This is not the same with Islamic banks where the SSB is supposed to make sure that accounting practices do not violate the *Shari'a*. This means that neither the management nor the auditor has the freedom to choose the accounting procedures which they prefer in preparing the financial statement of the bank. Rather, these accounting practices have to be *chosen* from and *justified* with reference to the *Shari'a*.

Hence, the fact that the current accounting practices of Islamic banks should be guided by moral principles suggests two important points. First, accounting practices of Islamic banks allow arbitrarily free choice within permissible limits. This could potentially lead to dangerous lack of uniformity and hence imply a case for regulation. Second, the resource allocation and wealth distribution resulting from the accounting practices of Islamic banks should be considered as fair by user groups in particular and (the Muslim) society in general.

However, if users of the financial statements of Islamic banks (notably investors and deposit accounts holders) are satisfied with the present mechanism used by Islamic banks in setting their accounting policy, particularly with regard to the compliance of these policies with the precepts of the *Shari'a* and the economic consequences resulting from them, then what are the factors that appear to have influenced the decision of Islamic banks to regulate their financial accounting and reporting? This issue is examined in the next section.

Regulation of financial reporting of Islamic banks

Islamic banks have recently agreed to explore alternative mechanisms of establishing accounting standards in order to regulate their financial reporting. The initiative was taken by the Islamic Development Bank[9] and was supported by Islamic banks at their annual meeting[10] in 1987.

There seem to be several possible factors which have influenced the decision of Islamic banks to endorse the above initiative. However, only one of these factors can be considered as major and pressing. The others can be regarded as desirable and supporting.

The major and pressing factor is the fear of Islamic banks that their regulatory agencies (mainly central banks and stock exchanges) may intervene to regulate their current accounting practices. This factor should be viewed from the one basic perspective which tends to govern the behaviour of Islamic banks, at least during this stage of their development. This perspective is that Islamic banks regard themselves as a recent phenomenon with which many regulatory agencies and financial institutions are still not conversant. In addition, the latter are not fully acquainted with the different accounting practices required for an Islamic bank to report its financial transactions. Hence, according to this perspective, Islamic banks are viewed by regulatory agencies and financial institutions as the odd organ in the business community.

In the USA, there are two major reasons which potentially provide a rationale for mandated corporate financial reporting. These are: (1) market failure and (2) social goals. Several arguments are put forward in support of disclosure regulations because of market failure. The first argument involves the firm as a monopoly supplier of information. It is argued that because the firm is a monopoly producer of information about itself it can suppress the reporting of (accounting) information and charge monopolistic prices. It is suggested that mandatory reporting would result in more information and a lower cost to society.

The second argument concerns the potential frauds and failures which can result from low quality financial reporting and auditing. It is suggested here that more and better regulation is needed to enhance the quality of financial reporting so as to protect the public from frauds and failures. The third argument addresses the problem of externalities. Externalities can occur if a producer of a public good (e.g. accounting information) cannot prevent all those who do not purchase the good from using it. Hence, in the absence of mandated financial reporting, it is argued that management would not be motivated fully to disclose information.

The second major reason for regulating financial reporting in the USA relates to social goals and emphasises the concept of 'fair reporting'. It is argued that in the absence of mandated disclosure some investors would be less informed than others. For example, corporate managers have more information about the value of the firm than do outside investors. It is suggested that regulation of financial reporting would prevent those with unfair access to private information from taking advantage of it.

It seems that the arguments relating to market failures and social goals in the USA equally justify the regulation of Islamic banks' financial reporting. This is mainly because almost all Islamic banks are established in developing countries where capital markets are usually not competitive or do not exist. In addition, given the increasing pattern in the size and number of Islamic banks as well as the number of their constituents, regulatory agencies may mandate accounting policies to achieve uniformity between Islamic banks and thereby improve the quality of their financial reporting.

Another reason, which does not apply to the USA but which can be advocated to justify Islamic banks' fear of regulation, is that unlike other business corporations in the countries in which they operate, almost all Islamic banks are the only unregulated business organisations. Hence, in countries such as Sudan, Pakistan and Iran where the whole banking industry has been 'Islamised', it would be peculiar to leave the accounting policy of such a vital sector of the economy unregulated for a long time.

On the other hand, in countries such as Egypt, Kuwait, Tunis and Malaysia where there is only one or a few Islamic banks, it is unlikely that the regulatory agencies will continue to mandate the accounting policies of other banks and at the same time remain silent about Islamic banks. However, it should be expected that the response of the regulatory agencies would differ from one country to the other depending on the number and size of Islamic banks (and other Islamic business organisations) and the cost of regulation.

One desirable reason for Islamic banks to regulate their financial accounting and reporting is to achieve a high degree of comparability, particularly in those countries where the whole banking system has been 'Islamised'. The regulatory process also may result in enhancing the perceived credibility of the financial statements of Islamic banks.

---

[9] The Islamic Development Bank is the largest non-commercial Islamic bank and is owned by the governments of Islamic countries.

[10] Almost all Islamic banks attend an annual meeting, which is organised by the Islamic Development Bank, in which they discuss matters of common interest.

Another desirable reason is that the development of accounting standards could be perceived by potential investors as a sign of an industry in the process of becoming mature. This would tend to gain Islamic banks the confidence of these investors as well as encourage the establishment of new Islamic banks. An important consequence of the latter is that the increase in the number of Islamic banks can enable them to mobilise more power to resist pressures from their environments.

In the light of the above reasons, Islamic banks would tend to prefer to take the initiative of establishing an independent body to regulate their financial reporting rather than leaving the matter to their regulatory agencies. Nevertheless, Islamic banks would be reluctant to be seen as neglecting the role which regulatory agencies (usually) play in mandating accounting policies of business corporations.

One possible way by which Islamic banks can gain the support of their regulatory agencies is to follow a strategy (like the one proposed below) which ensures that the latter has a significant role to play both in the institutional arrangements of creating the standards setting body and in the process of setting accounting standards. Furthermore, such a strategy could have several advantages, namely, (1) to convince regulatory agencies of the need of Islamic banks to have accounting standards different from those implemented in their country and accordingly to continue to allow the existence of dual accounting standards; and (2) to act as a buffer for Islamic banks from possible future pressure or intervention from their governments.

The meeting of Islamic banks recommended that the issue be discussed in a workshop[11] which appointed a steering committee to propose a structure for the promulgation of accounting standards taking into consideration the experience of other countries. The committee included in its membership representatives of regulatory agencies in addition to Islamic bankers, financial auditors, academics and *Shari'a* experts.

The representation of the latter group in this committee and other structures mentioned below reflects the other important parameter which Islamic banks have to consider in the process of promulgating accounting standards. Indeed, to maintain the credibility which they already enjoy in their present standard setting process, Islamic banks would have to demonstrate explicitly to an important large group of consumers of their financial statements that accounting standards would be promulgated in accordance with the precepts of the *Shari'a* (see Karim 1990).

This has implications for the proposed due process which gives user groups the right to express their views and comment on the proposed standards. The lobbying by influential constituents to favour one alternative over the other would prove futile unless the proposed alternative is in conformity with the *Shari'a*. However, if different competing alternatives, all of which are acceptable from the *Shari'a* point of view, are lobbied for by various user groups then *Shari'a* experts:

> would be expected to play an influential role in debates over which financial reporting system should be implemented, and their various views might favour particular user groups... Thus, there are good grounds to argue that in an Islamic context the process of setting accounting standards would certainly be a political one, but its outcome would never be a matter of social choice. (Gambling and Karim, forthcoming)

It follows that the consequences of such a due process should ease the concern of those who are looking for a (theoretical) solution to:

> the fundamental question of how preferences should be weighted across individuals in determining financial reporting policies. (Beaver and Demski, 1974, p. 184; see also May and Sundem, 1976; and AAA, 1977)

Given the various factors which Islamic banks have to take into consideration, it was felt by the committee, at that time, that a standard setting body similar to the USA Financial Accounting Standards Board (FASB) would be the ideal structure to promulgate accounting standards for Islamic banks. This option would also satisfy the characteristics which the committee stipulated that the standard setting body should have, namely independence, representation of affected constituents, a fair due process, adequate funding, and recognised authority by those who have to comply with the standards promulgated.

The committee therefore recommended the formation of a foundation consisting of a board of trustees and a financial accounting standards board. Each of the two boards would be composed of 21 part-time members mainly from the same categories which were represented in the committee plus users of financial statements of Islamic banks. The financial accounting standards board would be assisted by two subcommittees, namely a *Shari'a* subcommittee to review proposed pronouncements and advise the board on compliance with Islamic precepts; and a planning subcommittee to recommend priorities to the board and draw up its agenda.

---

[11] The author participated in this workshop and was a member in the two committees and the second workshop which discussed and recommended the structure of the standard setting body.

The composition of the two boards reflects the recognition of the committee that accounting standards are not exclusively the concern of accountants, particularly as the standards must be in conformity with the *Shari'a*.

While the main duties of the board of trustees would be limited to fund raising and appointment of members of the financial accounting standards board, the primary function of the latter would be to establish standards of financial accounting and reporting for Islamic banks. The financial accounting standards board would also issue two pronouncements—statements of financial accounting standards and practice guides—which would be exposed to a due process very much similar to that adopted by the FASB. The two pronouncements would be issued without dissent.

The committee presented its recommendations to the next anual meeting of Islamic banks in 1988. Although the meeting was in full agreement about the importance of establishing accounting standards, representatives of many Islamic banks expressed their concern that serious consideration should be given to alternative structures for promulgating accounting standards before a final decision was taken.

It seems that the committee was partly to blame for the reaction of Islamic banks. On the one hand, the failure of the committee to consider other options appears to have been perceived by Islamic banks as indicating that there could be other alternatives which are more suitable to their strategy of discouraging possible intervention by their regulatory agencies. On the other hand, some Islamic banks were concerned about the size of the proposed standard setting body which they felt was large enough to attract the intervention of regulatory agencies, particularly since the role of the latter in the institutional arrangements of the standard setting body was not explicitly addressed by the committee.

Accordingly, a new follow-up committee was appointed which consisted of several members of the previous steering committee and additional senior executives of Islamic banks. In formulating its recommendations, the committee was urged by the meeting to solicit the views of Islamic banks on the various possible structures of regulating their financial reporting. To this effect, the consultants of the follow-up committee visited four Islamic banks and interviewed some of their senior executives. The views of other Islamic banks were identified by means of a questionnaire.

A workshop, which was attended by representatives of Islamic banks, was called for, to discuss a number of alternatives which focused mainly on whether the setting of standards should be carried out exclusively either by Islamic banks or their regulatory agencies, or a combination of both.

The participants in the workshop chose to endorse the latter alternative. Although this alternative matches the (implicit) strategy of involving regulatory agencies in the standard setting process to avoid their intervention, it was not recommended on this ground. Nor was the alternative viewed by the workshop from the perspective that it would enable Islamic banks to retain the setting of accounting standards under their control and at the same time give recognition to the role of regulatory agencies in the process of establishing accounting standards. Rather, the workshop was of the view that the recommended alternative has the potential of achieving a higher degree of comparability of and confidence in the financial statements of Islamic banks. In addition, it would reduce the cost of regulation.

Moreover, the workshop recommended a structure similar to the one proposed by the first committee, namely the creation of a supervisory committee and a financial accounting standards board, each comprising 21 part-time members and having parallel responsibilities to the previous two boards. Furthermore, similar to what was proposed by the previous committee, the recommendation of the workshop also included the appointment of full-time technical staff. However, no *Shari'a* committee was suggested because it was felt that the membership of the *Shari'a* experts in the proposed structure was adequate.

The recommendations of the workshop, which were adopted by the committee, were fully endorsed by Islamic banks in their annual meeting in 1989.

However, the recommendations of the follow-up committee fell short of suggesting how the promulgated standards could be enforced, although some broad guidelines were mentioned in the recommendations of the first committee. However, the issue was not considered by Islamic banks in any of their meetings. Yet, it is expected that this issue might prove to be the most difficult part for Islamic banks in their efforts to regulate their accounting policies, and one of the major weaknesses of the proposed financial accounting standards board.

In the USA, the Securities and Exchange Commission is the government agency in charge of ensuring that firms subject to its jurisdiction comply with the financial accounting standards issued by the FASB. On the other hand, since Islamic banks mainly operate in government driven economies, the financial accounting standards board might find that the only way to enforce its standards fully was by relying on the support of the government agencies concerned. The latter would include stock market, central bank, or any other regulatory body in charge of enforcing financial accounting standards. However, this could be a major stumbling block since it is hard to tell whether the regulatory agencies concerned in the various countries in which Islamic banks are established would be willing to play that role. And even if some of them agreed to consider the promulgated standards as having 'substantial authoritative support', others might not.

Apparently, the board might have to phase in the enforcement of its standards in two stages. The initial stage can be considered as an experimentation period during which Islamic banks are offered the option of voluntary adherence to the standards promulgated by the Board. However, whether Islamic banks would adopt the standards or not seems to depend on the extent to which this would (1) discourage the intervention of their regulatory agencies and (2) enhance the perceived credibility of their financial statements. In the second stage, the aim of the board would be to enforce its standards fully.

Conclusion

Islamic banks use several mechanisms to execute their financing and investment transactions because interest is strictly prohibited by the *Shari'a.* Almost all Islamic banks currently employ in-house religious advisers who together with the financial auditor and the management of the bank agree on the accounting treatment of the bank's business transactions which have to be in conformity with the *Shari'a.*

However, the fear of Islamic banks of possible future intervention by their regulatory agencies in their current accounting practices seems to be the predominant factor that has motivated Islamic banks to establish a standard setting body to regulate their financial accounting and reporting. Although Islamic banks may have adopted the strategy of involving their regulatory agencies in the process of promulgating their accounting standards in order to deter their intervention, it remains to be seen whether these agencies will agree to be the mechanism through which the standards will be enforced in the future.

References

American Accounting Associating (AAA), *Report of the Committee on the Social Consequences of Accounting Information* (Sarasota, FL: American Accounting Association, 1977).

Abu Saud, M., 'Interest-Free Banking', paper presented at the First International Conference on Islamic Economics, Makka, Saudi Arabia (1976).

Al-Qaradawi, Y., *Figh Al-Zakah* (The Jurisprudence of Zakah) (Beirut: Moussat Al-Risaalh, 6th. ed., 1981).

Banaga, A. 'Islamic Banking System: Some Problems in Basic Concepts', *Pakistan Accountant* (October–December 1987), pp. 31–38.

Beaver, W. H. and Demski, J. S., 'The Nature of Financial Accounting Objectives: A Summary and Synthesis,' *Studies on Financial Accounting Objectives*, Supplement to *Journal of Accounting Research* (1974), pp. 170–187.

Briston, R. and El-Ashker, A., 'Religious Audit: Could It Happen Here?', *Accountancy* (October 1986), pp. 120–121.

Gaa, C. J., *Methodological Foundations Of Standardsetting For Corporate Financial Reporting* (Sarasota, Florida: American Accounting Association, 1988).

Gambling, T. E. and Karim, R. A. A., *Islam and the Theory of Accounting: The Business of Obedience* (London: Mansell Publishing Co., forthcoming).

Hashimi, F. A., 'The Need and Rationale for Setting Up of Accounting Standards for Islamic Banks,' *Pakistan Accountant* (October–December 1987), pp. 23–29.

Hendriksen, E. W., *Accounting Theory* (Homewood, Ill: Richard D. Irwin, 3rd ed., 1977).

Karim, R. A. A. and Ali, A. E., 'Towards an Understanding of the Financing Mechanisms of Islamic Banks,' *Arab Journal of the Social Sciences* (April 1988), pp. 55–66.

Karim, R. A. A. and Ali, A. E. 'Determinants of the Financial Strategy of Islamic Banks,' *Journal of Business Finance and Accounting* (Spring 1989), pp. 193–212.

Karim, R. A. A., 'The Independence of Religious Auditor and External Auditor: The Case of Islamic Banks,' *Accounting, Auditing and Accountability Journal* Vol. 3 No. 3 (1990).

May, R. G. and Sundem, G. J., 'Research for Accounting Policy: An Overview,' *Accounting Review* (October 1976), pp. 747–763.

Parker, Bob, 'Creative Accounting: Medieval Style,' *Accountancy* (October 1988), p. 140.

Tawney, R. H., *Religion and the Rise of Capitalism* (London: John Murray, 1926).

Tomkins, C. and Karim, R. A. A., 'The Shari'a and its Implications for Financial Analysis: An Opportunity to Study Interactions Between Society, Organizations and Society', *American Journal of Islamic Social Sciences* (September 1987), pp. 101–115.

Weber, M., 'Die protestantische Ethik und der Geist des Kapitalismus,' (The Protestant Ethic and the Spirit of Capitalism), *Archiv für Sozialwissenschaft und Sozialpolitik*, Vols xx & xxi (1904–5).

THE ACCOUNTING HISTORIANS JOURNAL

Semiannual Publication of The Academy of Accounting Historians

Volume 16, Number 2 **December 1989**

CONTENTS

Main Articles
A Kuhnian Interpretation of the Historical Evolution of Accounting—Barry E. Cushing
Early Accounting: The Tally and Checkerboard—W. T. Baxter
The Irony of "The Golden Age" of Accounting Methodology—Tom Mouck
Medieval Traders as International Change Agents: A Comparison with Twentieth Century International Accounting Firms—Larry M. Parker
A Historical Analysis of Depreciation Accounting: The United States Steel Experience—Sarah A. Reed
A History of the Academy of Accounting Historians—Edward N. Coffman, Alfred R. Roberts, and Gary John Previts

Features
1989 Accounting Hall of Fame Induction
  Introduction—William W. Cooper
  Citation—Thomas J. Burns
  Response—Yuji Ijiri
Memorial to the Late Emeritus Professor Kojima (1912–1989)—Yoshihiro Hirabayashi
The Accountant and the Investor—George O. May [Reprint of a lecture delivered in 1932]

Reviews of Books and Other Publications
Bodenhorn, *Economic Accounting*—Catherine Lemieux
Brown, *Hierarchy, History, & Human Nature: The Social Origins of Historical Consciousness*—Jenice P. Stewart
Chambers and Dean, *Chambers on Accounting: Mots Against the Current*—Chris Poullaos
"Historia de la Contabilidad an España," Special Issue of *Revista Española de Financiación y Contabilidad*, (Enero-abril 1988)—Salvador Carmona
Loft, *Understanding Accounting in its Social and Historical Context*—Victoria Beard
Swetz, *Capitalism and Arithmetic: The New Math of the 15th Century*—Maurice S. Newman
Tantral, *Accounting Literature in Non-Accounting Journals: An Annotated Bibliography*—Robert J. Bricker
Yamey, *Art & Accounting*—Stephen D. Strange

1989 Hourglass Award

Contents of Research Journals

Accounting and Business Research, Vol. 20, No. 80, pp. 307–313, 1990

The Accounting Burdens Facing Small Firms: An Empirical Research Note

Kevin Keasey and Helen Short*

Abstract—In recent years there has been much discussion regarding the burdens imposed on small firms by administrative requirements, and in particular those imposed by accounting requirements. The purpose of this note is to examine whether the relative burden of accounting requirements is general to small firms or specific to certain types of small firm. The main empirical finding of the note, using ordered probit analysis on a sample of 100 small firms, is that the relative burden of accounts as perceived by small firms is not contingent on the factors investigated.

Introduction

Over the last few years, there has been a lot of debate over the administrative burdens imposed on small firms. This research note focuses on the burden imposed by the preparation of annual accounts compared to those imposed by other requirements. The major purpose of the note is to inform the debate by investigating empirically whether organisational, financial, size and type of accountant variables possess explanatory power in respect of small firms' perceptions of the relative burden of annual account preparation.

The note is organised into four sections. The first section briefly examines the administrative requirements facing small firms. The second section describes the data set, the model, the variables and the empirical methods used to investigate the factors influencing the relative burden of annual accounts. The third section discusses the empirical findings. The fourth and final section presents a discussion of the findings and conclusions.

The accounting burdens facing small firms

The administrative burdens imposed on small firms mainly arise from government regulations. A DTI report (1985a) examining such burdens found that real additional costs were imposed on small firms. Compliance costs were categorised into 'staff/management time' and 'direct expenses'. The cost of time, particularly management time, was found to be the key element in the burden and it was noted that:

> Management time is a small firm's most precious resource. The smaller the firm, the more precious it is. (p. 3)

This suggests that the burdens a firm faces may be a function of its size. In terms of the burdens imposed by accounting standards, recent technical releases by the ASC (TR 690 and TR 706), drawing on the research findings of Carsberg et al. (1985), conclude that there is no evidence to suggest that small companies find compliance with accounting requirements unduly burdensome. However, although Carsberg et al. (1985) note that:

> The burden imposed by accounting standards and other reporting requirements does not seem to be a matter for primary concern among people in small companies (p. 83),

they do suggest that the finding is a result of the lack of awareness by small company managers of the burdens of compliance, rather than the lack of such burdens.

The notion of perceived burdens (both absolute and relative) is problematic, as managers do not necessarily assess all the costs of an activity. For example, additional burdens associated with the statutory production of accounts, that may not be directly perceived as such, are the loss of privacy and the opportunity cost of not being able to use preferred disclosure and measurement rules. In addition, whilst the absolute burden of complying with administrative requirements may decrease as firm size increases, the relative burden may remain stable. That is, there may be economies of scale affecting the levels of costs incurred in meeting all administrative requirements (i.e. a proportion of such costs may be fixed), so that all burdens fall as a proportion of the total cost as firm size increases, but the rankings of the different burdens remain stable. It may also be the case that the absolute benefits associated with compliance may increase with the size of a firm, thus resulting in an increasing net benefit-cost of compliance as a function of firm size.

---

*The authors are members of the Accounting and Finance Group, School of Economics and Business Studies, Leeds University.

The notion of requirements leading to more benefits the larger the firm is likely to be especially true for annual accounts. Larger companies, with external shareholders and other users, are likely to gain more benefit from the preparation of annual accounts than smaller companies and firms, with few, if any, external users of their accounts. The benefits of accounts preparation are likely to be particularly noticeable for larger companies seeking external finance. Technical release 690 (para. 10) notes that:

> On the basis of a cost/benefit analysis the larger company has proportionately lower costs of, and higher benefits from, accounting information, than does a smaller company.

It could be argued, however, as in TR690 para. 11, that, because there are few other sources of information, small company shareholders benefit proportionately more from the provision of accounts. However, as the major shareholders of small companies are generally involved in the day-to-day management of the company, they may have free access to more timely and relevant information.

The general conclusion to be drawn from the above is that, although small firms are not necessarily fully aware of the costs of compliance with accounting requirements, such compliance does impose a burden on small firms. However, it is difficult to draw any firm conclusions as to the effect of the size of a firm on the relative burden of annual accounts.

Various studies have questioned small firms as to the relative ranking of administrative requirements in terms of cost, time and effort to complete. For example, Carsberg et al. (1985), identifying the most common administrative requirements as VAT, annual accounts, PAYE, DHSS, bank information, corporation tax and other requirements, found that the most burdensome requirement was VAT returns, followed by PAYE, DHSS work and annual accounts. The interesting point, from the point of view of this research note, was that respondents were divided as to their opinions of the relative burden of annual accounts—it was either considered the most burdensome requirement or close to the least burdensome requirement. The purpose of this note is to extend the existing literature by considering whether the relative burden of annual accounts is influenced by various factors, such as the size of the firm, the use of computers in the preparation of annual accounts, the age of the firm, etc.

Data, model and variables, and empirical methods

(i) *Data*

The data used in the note are from questionnaire based interviews with 100 small firms in North East England in 1986. Of the firms interviewed, 50 were in the high technology sector, defined as 'Electronic or Electrical Engineering and Computing', and 50 were in the low technology sector, defined as any sector other than high technology. The sample was selected from a large data base, consisting of approximately 700 companies constructed for an ESRC funded project on small firm failure.

The questionnaire was pilot tested on five firms randomly selected from this larger data set. The final survey sample was constructed by randomly selecting high technology firms from the larger data set until 50 had been interviewed. Any shortfall was met by using small firms outside the database, the names of which were supplied by the local Chamber of Commerce. Fifty low technology firms were matched to the high technology sample, as far as was possible, in terms of size, age and location. Whilst the authors are aware that this approach to ensuring sufficient sample size runs the risk of a response bias, no formal analysis of non-response bias was undertaken for the following reasons. First, the technology variable does not feature in the current analysis. Second, even if the samples were chosen in terms of certain proportions for a potential explanatory variable (technology), then the assumption that the explanatory variables in a regression equation (or one of its variants) are independent, implies that (in theory at least) the coefficients or the variances for the other explantory variables should be unaffected. Third, even if the samples were chosen in terms of the proportions of a dependent variable or a variable highly correlated with it, Zmijewski (1984) shows that the potential for bias does not affect statistical inference.

(ii) *Model and Variables*

The model used to investigate the possible explanations of the relative burden of accounts is as follows:

$$Y = f(X_1, X_2, \ldots X_{12}),$$

where Y is the dependent variable, defined as the relative burden of annual accounts, ranked 1 for the greatest burden to 8 for the least burden, or 9 if the burden was not ranked. The data for this variable came from asking firms to rank the following administrative requirements in order of cost, time and effort to complete from 1 to 8:[1]

VAT
Annual accounts
PAYE
DHSS (including holiday and sick pay)

---

[1] Whilst it may have been preferable to consider the absolute burden of accounting requirements, the difficulties of obtaining reliable data on such led to the consideration, as in the other works on small firms, of the relative burden.

Bank information
Corporation tax/business tax
Management accounts
Other requirements.

X_1 to X_{12} are the explanatory variables. The specific questions and frequencies for the dependent and explanatory variables are given in the appendix.

X_1 is coded 1 if the firm is an incorporated company, 0 if not. Due to the statutory regulations governing the financial reporting of incorporated companies, the burden is hypothesised to be greater than that imposed on unincorporated businesses.

X_2 is coded 1 if benefits are perceived from preparing annual accounts and 0 if not. A firm's assessment of the burden of annual accounts is hypothesised to be lower if there are perceived benefits than if production of accounts is believed to carry no benefits.

X_3 is coded 1 if a large firm of accountants is used, and 0 otherwise. Although there is little evidence as to why a minority of small firms choose to use a large firm of accountants, in terms of their effects on accounting burdens, there are a number of possibilities. First, large accountancy practices may offer a higher quality service and hence reduce the burden of a business preparing annual accounts. Second, the use of a large firm of accountants may be an indication that the accounts are to be used for external purposes (for example, in seeking external finance), and therefore, their preparation should have benefits, reducing the preceived burden. Third, the specific experience of the large accountancy firm staff engaged in the preparation of small company accounts might be lower than is the case with small firms of accountants, thus possibly increasing the burden on the firm itself. Finally, small firms of accountants might reduce the burden because they are able to develop closer working relationships. Therefore, the effect of the size of the accounting firm used on the perceived burden of accounts preparation is unsigned.

X_4 is coded 1 if all the general accounting needs of a firm are believed to be provided by its professional firm of accountants, 0 if not. If the accounting firm provides all the accounting needs, then the relative burden of preparing accounts is hypothesised to be less.

X_5 is coded 1 if the annual accounts are prepared externally by an accountancy firm or 0 if they are prepared internally. We hypothesise that if the accounts are prepared externally, a firm is likely to feel less of a burden (Carsberg et al. 1985, p. 29).

X_6 is coded 1 if management accounts are prepared weekly or monthly, 0 if prepared quarterly or never. Regular management accounts are hypothesised to aid the preparation of and therefore ease the burden of annual account preparation.

X_7 is the natural log of the number of employees. As discussed in section 1, the effect of the size of a firm on the relative burden of annual accounts is unclear.

X_8 is coded 1, if a respondent considered the volume of turnover to have grown between 1982 and 1986, coded 0 if not. Growing firms are hypothesised to face confusion in their recording systems as a result of growth, hence the relative burden of annual accounts would be greater.

X_9 is coded 1 if computers are used by the firm to prepare annual accounts and 0 otherwise. We hypothesise that the use of computers in this area will reduce the relative burden of annual accounts.

X_{10} is the natural log of the age of the firm. This variable is included to capture the possibility that the longer the firm has been in business, the lower the relative burden of annual accounts.

X_{11} is coded 1 if the owner/founder has previous business experience, 0 if not. Previous business experience is hypothesised to reduce the burdens imposed by administrative requirements. However, the effect on relative burdens would be dependent on the nature of the previous experience.

X_{12} is coded 1 if start-up advice was received, 0 otherwise. The receipt of start-up advice would be expected to reduce administrative burdens but, as argued above, the effect on the relative burdens would be dependent on the nature and extent of that advice.

(iii) *Empirical Methods*

Given the nature of the dependent variable, and the existence of dichotomous and categorical explanatory variables, the univariate results are based on the Spearman rank order correlation test. In terms of the multivariate analysis, the presence of an ordinal dependent variable means that classical regression analysis is unsuitable and an ordered probit estimating technique is used instead (see McKelvey and Zavoina, 1975, for a description of the technique and an evaluation of its merits).

Empirical results

The univariate and multivariate results shown in columns 2 and 3 of Table 1 respectively, indicate that at the 95% confidence level all the explantory variables are statistically insignificant. Given the approximately bimodal nature of the dependent

Table 1
Explanatory Variables

	Description	(1) *Expected Sign*	(2) *Rank Corr.*	(3) *Reg. Coeff.*	(4) *T-Ratio*
X_1	Ownership type	+ve	0.0431	0.044215	0.124
X_2	Perceived benefits from preparation of annual accounts	−ve	−0.0323	−0.148852	−0.490
X_3	Size of accountancy firm	?	−0.1102	−0.461110	−0.647
X_4	Provision of all accounting needs by accountant	−ve	−0.0274	0.165338	0.413
X_5	Preparer of annual accounts	−ve	−0.0774	−0.377840	−1.210
X_6	Regularity of preparation of management accounts	−ve	−0.0211	0.110610	0.354
X_7	Number of employees	?	−0.1411	−0.041169	−0.189
X_8	Growth in volume of turnover	+ve	−0.0729	−0.096613	−0.262
X_9	Use of computer for preparation of annual accounts	−ve	0.0267	0.255555	0.597
X_{10}	Age of business	+ve?	−0.0818	−0.162978	−0.992
X_{11}	Previous business experience	−ve?	0.1054	−0.280512	−0.696
X_{12}	Receipt of start-up advice	−ve?	−0.1063	−0.517310	−1.267

Using the log-likelihood ratio test, the function is insignificant at 0.05 levels of confidence.

variable (see the frequency distributions in the appendix), the results suggest that the perceived burden/non-burden of accounts is either of a general nature, experienced regardless of individual circumstance, or related to factors not identified in this note.

Examination of the Spearman correlation coefficients of the independent variables, presented in Table 2, indicates the presence of some collinearity between the independent variables. For example, incorporated companies and older firms are more likely to perceive benefits from the preparation of annual accounts than other firms. Size (in terms of the number of employees) is positively related to the age of the firm. A surprising finding is that both size and age are negatively related to the frequency of management reporting, a result that perhaps warrants further investigation. Whilst the authors acknowledge the potential problems caused by correlated independent variables, experimental elimination of correlated variables did not alter the tenor of the results presented above and in Table 1.

Discussion and conclusions

Since at least the mid 1980s concern has been expressed over the administrative burdens faced by small firms. In terms of the burden of accounts, existing research by Carsberg et al. (1985) found that firms either ranked the burden of accounts relatively high or relatively low; a similar finding is noted for the results presented here. The purpose of this note has been to extend the existing literature and extend the debate on the accounting burdens facing small firms by examining whether the perceived relative burden of accounts is general or contingent on a number of firm specific factors.

Both the univariate and multivariate results suggest that, in general, the perceived relative burden of annual accounts is not influenced by the specific factors investigated. The perceived relative burden of accounts, be it high or low, seems to be an experience not conditional on the individual factors identified by this research. There are, therefore, two results of note presented here. First, only approximately half of the firms interviewed placed accounting requirements in the top half of their rankings of administrative burdens. This is not surprising, in that 60% of the sample (see the frequencies for question 2 in the appendix for further details) found the production of annual accounts beneficial in the management of the business, in obtaining credit and raising finance or just generally useful. Second, the relative rankings of accounting requirements are not contingent on the firm specific factors explored here.

The present study may be compared to that of Holmes and Nicholls (1989), which investigated the factors determining the information requirements of Australian small businesses. Separating information requirements into three categories—statutory information, budgetary information, and additional information (defined as information of a non-statutory nature)—Holmes and Nicholls reported that a significantly greater proportion of small businesses sought statutory and budgeted information from external accountants than prepared it internally, whilst the reverse existed for additional information. The preparation of additional information was found to be limited, suggesting that accounting information is prepared predominantly to comply with statutory requirements. Alternatively, it may be the case that the majority of small businesses do not find additional information to be useful, the information prepared or acquired to comply with statutory requirements being sufficient for their needs. Small firms were found, in general, to be more likely to prepare to acquire additional information if they were relatively large (in terms of number of employees and turnover), if they were less than ten years old, if they were in the manufacturing, wholesale, business/finance or service sector and if the owner/manager undertook further or higher education.

Holmes and Nicholls, therefore, provide insights into the factors influencing the preparation or acquisition of accounting information over and above that required by statute. In addition, the present study provides a complementary examination of the factors that might determine whether the statutory accounting requirements are perceived as being a burden or not. Comparing the Holmes and Nicholls study with the present study, it would appear that, although the preparation or acquisition of additional accounting information is dependent on firm specific factors, the burden imposed by general accounting requirements is not.

The research findings of this note, therefore, cautiously suggest that if the burdens associated with the production of annual accounts are to be reduced in the small firm sector, attention will have to be given, by both researchers and practising accountants, to the general costs and benefits of the accounting requirements imposed on small firms.

Table 2
Spearman Correlation Coefficients

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}
X_1	1.0000	0.2210	0.1745	−0.0303	−0.0120	−0.0904	0.2240	−0.0527	0.0904	0.4553	0.0474	−0.0722
X_2		1.0000	0.0143	0.0097	−0.0397	−0.1561	0.1275	0.1404	0.0330	0.2327	−0.0213	−0.0178
X_3			1.0000	0.0225	−0.1149	0.0916	0.0509	0.0590	0.1963	0.1850	0.0221	−0.0482
X_4				1.0000	0.2428	−0.0846	0.0339	0.0664	−0.0989	−0.1165	0.0712	−0.0283
X_5					1.0000	−0.0501	−0.0331	0.1898	−0.1309	−0.2070	0.0006	0.0919
X_6						1.0000	−0.2084	−0.0006	0.0143	−0.2243	0.0273	0.0621
X_7							1.0000	−0.2692	0.1658	0.4404	−0.2339	−0.3371
X_8								1.0000	0.0314	0.0178	0.0131	0.1219
X_9									1.0000	0.2886	0.1120	−0.0171
X_{10}										1.0000	−0.0687	−0.3256
X_{11}											1.0000	−0.0124
X_{12}												1.0000

References

Accounting Standards Committee, (1988a), *Statement by the Accounting Standards Committee on the Application of Accounting Standards to Small Companies*, TR690, February 1988.

Accounting Standards Committee, (1988b), *Statement by the Accounting Standards Committee on the Definition of 'Small Company' for the Purpose of Applying Accounting Standards*, TR706, July 1988.

Carsberg, B. V., Page, M. J., Sindell, A. J. and Waring, I. D., (1985), *Small Company Financial Reporting*, Prentice-Hall International.

Department of Trade and Industry, (1985a), *Burdens on Business*, HMSO, March, London.

Department of Trade and Industry, (1985b), *Accounting and Audit Requirements for Small Firms: A Consultative Document*, HMSO, London.

Holmes, S. and Nicholls, D., (1989), 'Modelling the Accounting Information Requirements of Small Businesses,' *Accounting and Business Research*, Vol. 19, No. 74, pp. 143–150.

McKelvey, R. D. and Zavoina, W., (1975), 'A Statistical Model for the Analysis of Ordinal Level Dependent Variables,' *Journal of Mathematical Sociology*, Summer 1975, pp. 103–120.

Zmijewski, M. E., (1984), 'Methodological Issues Related to the Estimation of Financial Distress Prediction Models,' *Journal of Accounting Research*, 22. Supp 1984, pp. 59–82.

Appendix

Questionnaire

Dependent variable

Please rank the following administrative requirements in terms of cost, time and effort to complete from 1 (most burdensome) to 8 (least burdensome):

VAT
Annual accounts
PAYE
DHSS (including holiday/sick pay)
Bank information
Corporation tax/business tax
Management accounts
Other requirements

The rankings given to annual accounts are as follows (coded 9 if the burden is not ranked):

Rank	No. of firms
1	24
2	10
3	14
4	6
5	2
6	3
7	1
8	0
9	40
	100

Explanatory variables

Question 1 Is (name of firm)	A non-quoted company	2
	A quoted public company	0
	A private limited company	75
	An unlimited company	4
	A partnership	7
	A sole proprietorship	11
	Other	0
	Don't know/Missing	1
Question 2 What benefits, if any, does your company receive from producing annual accounts?	Uses in management of the business	35
	Obtaining credit facilities, raising additional finance	23
	Other benefits	2
	No benefits	38
	Don't know/Missing	2
Question 3 Do you use a large or small firm of accountants?	Large	9
	Small	86
	Don't know/Missing	5
Question 4 Do (your accountants) provide for all your accounting needs?	Yes	70
	No	25
	Don't know/Missing	5
Question 5 Who actually prepares your company's accounts?	A director	19
	Accountant employed by the company	9
	External firm of accountants	25
	External firm of accountants who also audit your accounts	47

Question 6 How often are management accounts prepared?	Weekly	7
	Monthly	57
	Quarterly	23
	Never	13
Question 7 How many persons are presently employed at this establishment?	Mean	16.93
	Standard Deviation	16.92
Question 8 What was the general trend in the volume of turnover in the period end–1982 to present?	Increased	82
	Remained static	12
	Decreased	5
	Don't know/Missing	1
Question 9 Do you use computers in your business for the preparation of year-end accounts?	Yes	20
	No	79
	Don't know/Missing	1
Question 10 When did (name of firm) first start business?	Mean	15.36
	Standard Deviation	17.66
Question 11 Had you/he/the founder been in business before as an owner?	Yes	18
	No	79
	Don't know/Missing	3
Question 12 Did you receive any financial, technical or managerial assistance from any public and/or private agencies, whose function is to help businesses, during your first year of operation?	Yes	18
	No	81
	Don't know/Missing	1

Pacific Accounting Review

Editors
K. J. Moores
A. C. MacGregor

Published by
New Zealand
Society of
Accountants

Volume 2 December 1989 Number 1

CONTENTS

Editorial iii
Editorial Policy v
Subscription form to *Pacific Accounting Review* vii

Main Articles

Reactions by Australian Firms to Accounting Regulations
Ian Zimmer 1
Factors Affecting Post-Takeover Shareholder Returns
Keith Duncan, Ken Moores, Michael Pead, and Helen Roberts 19
Cognitive Style, Non-Audit Services and Perceptions of Auditor Independence
Ferdinand A. Gul 51
A Cross Methodological Test of Some Aspects of the Validity of Laboratory Experiments: An Application to Financial Decision Making
Ross Mear and Michael Firth 62
Does Gender Affect Performance in Accounting Courses?
Stephen P. Keef 77
Organisational Structure and Company Performance: Some New Zealand Evidence
R. T. Hamilton and Gurvinder Singh Shergill 88
Survival Rate of the New Zealand Company
Roger Skillin 103
Perception Data-Gathering: A Note on Mail Questionnaire Methodology and Bias
John K. Courtis 118

Book Reviews

M. Ezzamel and H. Hart, *Advanced Management Accounting—An Organisational Emphasis.* Reviewed by *Martin Putterill and Stewart Lawrence* 138
L. D. Parker, K. R. Ferris, and D. T. Otley, *Accounting for the Human Factor.* Reviewed by *Clinton Cattermole* 147
Alvin A. Arens and James K. Loebbecke, *Auditing: An Integrated Approach.* Reviewed by *David Hay* 152
William T. Cloake, *Statistical Modeling Using 1-2-3 (V.2).* Reviewed by *Alan Stent* 156
Ron Weber, *EDP Auditing: Conceptual Foundations and Practice.* Reviewed by *Michael J. Pratt* 160
Contents of Recent Accounting Journals 165
Guide to Authors 167

Pacific Accounting Review is published annually by the New Zealand Society of Accountants.
Subscription enquiries should be made to the New Zealand Society of Accountants, PO Box 11342, Wellington, New Zealand.
Editorial correspondence should be addressed to Professor David Emanuel, Department of Accounting and Finance, University of Auckland, Private Bag, Auckland, New Zealand.

Accounting and Business Research, Vol. 20, No. 80, pp. 315–327, 1990

A Longitudinal Study of Accounting Changes: The UK Gas Industry 1969–1974

W. M. McInnes*

Abstract—This longitudinal study of accounting changes in a UK context attempts to augment the cross-sectional studies of accounting choices conducted mainly on US data. The accounting changes made for the UK gas industry are investigated for the five years from 1 April 1969 to 31 March 1974. The multi-period effects of these accounting changes on the reported outcomes for each year of the quinquennium are estimated together with their cumulative effects on these reported outcomes. Three possible incentives for the accounting changes are identified and explored: improved justifications for increases in gas prices; increases in the compensation payable for price restraint; and avoidance of wealth transfers to the Treasury. The accounting changes had cash flow consequences, some of which were the result of the multi-period effects. Some of the cash flow consequences of the accounting changes appear to have been unintended.

Introduction

In recent years some accounting researchers have been developing a positive theory of accounting which attempts to explain accounting practices (see Watts and Zimmerman, 1986, for a recent summary). These researchers assume that managers choose those accounting practices which best serve their self interest. Based on this assumption arguments which attempt to explain managers' accounting practices have been generated from the literature on the contracting process and from that on the political process.

From the former it is argued that the terms of particular contracts provide incentives for managers to adopt income-increasing accounting choices. It is argued that if a firm operates a management compensation plan its managers have incentives to adopt income-increasing accounting choices in order to increase the bonus payments they receive. It is also argued that the higher the proportion of debt to equity the more likely it is that managers will adopt income-increasing accounting choices in order to reduce the probability of violating restrictive covenants in debt contracts.

The political process is argued to provide incentives for managers of some firms to adopt income-decreasing accounting choices. For instance, it is argued that if a firm is subject to regulation of its prices its managers have incentives to adopt income-decreasing accounting choices in order to provide a more convincing case for an increase in prices and hence increase the firm's cash inflows. Similarly it is argued that if a firm is politically sensitive its managers have incentives to adopt income-decreasing accounting choices in order to reduce its political sensitivity and hence the probability of suffering negative wealth transfers or political costs which would increase the firm's cash outflows.

Many of the empirical studies grounded in this theoretical framework test hypotheses derived from the arguments relating to management compensation plans, debt contracts and political costs (see Watts and Zimmerman, 1986, chapter 11 for a review of the empirical studies). Consequently, interpretation of the results of this research requires ex post rationalisation of the trade-offs the managers faced between the conflicting pressures from the contracting and political processes when making the accounting choices. The only investigation of the effect of price regulation on accounting is by Jarrell (1979). He found that the introduction of rate-of-return regulation in the United States appeared to have provided an incentive for electric utilities to revise upwards the valuation of their asset bases. This reduced the reported rate of return and hence enhanced the arguments for a rise in electricity prices.

This study aims to overcome the problems associated with the conflicting pressures on accounting from the contracting and political processes by focusing on a situation where there appeared to be only one set of pressures—those from the political process. Such a situation appeared to exist for the UK gas industry from 1969 to 1974, a period during which the industry was state-owned. As the study is longitudinal it will focus on the accounting *changes* made from one year to the next in the gas industry's set of accounting *choices*.

---

*The author is senior lecturer in accounting at the University of Strathclyde. He is grateful to Professor Sid Gray, University of Glasgow, Professors Peter Pope and Tony Puxty, University of Strathclyde, Professor Ross Watts, University of Rochester and an anonymous referee for helpful comments at various stages of this research. The imperfections which remain in the paper are, however, the responsibility of the author.

It seems unlikely that the incentives driven by the previously identified contracting process have affected the nationalised gas industry's accounting. Like most nationalised industries the gas industry (1) did not operate management compensation plans (Likierman, 1983, p. 33) and (2) did not have a need for restrictive covenants in debt contracts to protect the interests of the bondholders because most of the industry's external finance was received from the government in the form of fixed-interest loans and there was no equity capital. Even the argument derived from Fama (1980) that top management may be participants in the managerial labour market and their values in that market may be enhanced if they can be seen to have been running a profitable firm seems unlikely to have provided incentives for making income-increasing accounting changes in the gas industry as the individuals in the relevant top management positions during that time pursued careers solely within the industry until retirement.[1]

On the other hand it is possible that the industry's accounting was subject to pressures from the political process. Positive accounting researchers have not explored the effect of the political process on the incentives of the managers of state-owned enterprises. However, Aharoni (1981) has argued that as governments tend to set state-owned enterprises irreconcilable and sometimes conflicting goals and as the relative importance of these goals may change with a change of government the managers of these enterprises have incentives to adopt strategies which will increase their autonomy or room for manoeuvre. He suggests that one such strategy is to reduce the firm's dependency on the government by reducing or avoiding the need to borrow additional funds. Like most state-owned or nationalised industries the gas industry had only one other major source of additional funds, namely to increase prices. As gas prices were subject to regulation and as the financial outcomes reported in the published accounts had a role to play in that regulation, it might be argued that gas industry management had an incentive to make income-decreasing accounting changes in order to improve the argument for a gas price rise which would increase the industry's cash inflows and hence management's relative autonomy from the unpredictable world of politics.

Similarly gas industry management might have had an incentive to make income-decreasing accounting changes in order to avoid the imposition of political costs or negative wealth transfers which would decrease the funds available to management and thus their relative autonomy. As will be seen in the next section the UK gas industry had many of the characteristics that positive accounting theorists have argued increase a firm's political sensitivity so it might have been particularly susceptible to the imposition of political costs.

The paper proceeds in five sections. The UK gas industry during the 1969 to 1974 period is described in the first section. The research approach adopted is explained in the second. The accounting changes made during the five years are described in the third. The possible incentives for the accounting changes are explored in the fourth and conclusions are provided in the fifth.

UK gas industry 1969–1974

The Gas Act 1948 provided the legislation for the nationalisation of the UK gas industry. The Nationalisation Acts set out the duties of the boards of nationalised industries[2] and also the power and duties of Ministers. Each industry dealt with the government department headed by the Minister to whom the industry was responsible. That government department was known as an industry's 'sponsoring' department as part of its responsibilities included looking after that industry's interests in discussions with the Treasury and other government departments. The Minister in charge of the 'sponsoring' department had formal responsibility in the House of Commons for answering questions which related to each industry responsible to him as well as being responsible for government policy in relation to that industry. The gas industry's sponsor department up to October 1969 was the Ministry of Power, from October 1969 to October 1970 it was the Ministry of Technology and from October 1970 to March 1974 it was the Department of Trade and Industry.

The Minister, civil servants and members of each industry's board could be questioned by the Select Committee on Nationalised Industries (SCNI) on any matter relating to an industry. An SCNI investigation in 1968 explored the relationship between industry managers, civil servants and government ministers (Select Committee on Nationalised Industries, 1968). The gas industry's sponsor department at that time, the Ministry of Power, provided evidence (pp. 333–357). It claimed to be in constant touch with the industries for which it had responsibility and saw one of its functions as being the 'two-way traffic of ideas' between government ministers and the industries (para. 3). Matters such as pricing (Annex 7, para. 12) were discussed with the Treasury in the context of the government's economic policy. As regards the industries' annual accounts the Ministry's evidence (Annex 3, para. 10) stated that:

---

[1] See *Who's Who* for Sir Henry Jones, Chairman to 31 December 1971; Sir Arthur Hetherington, Deputy Chairman to 31 December 1971 and Chairman thereafter; Sir Denis Rooke, Deputy Chairman from 1 January 1972; J. H. Smith, Member for Finance from June 1972 and W. G. Jewers, Director of Finance throughout the quinquennium.

[2] For a definition of a nationalised industry see National Economic Development Office (1976, Appendix Volume, pp. 2–3). For a fuller description of the system of accountability see Likierman (1985, pp. 132–184).

> The Minister may direct, with Treasury approval, the form of the accounts. In practice, the directions, which continue in force until revised in the light of new circumstances, are in general terms, and leave the boards considerable latitude in deciding the precise form in which the accounts are published. The directions are reproduced in the Annual Report and Accounts for the year to which the directions first apply.

For the period of the study the guidelines for the control of the nationalised industries were specified through the 1967 White Paper (Cmnd 3437) (Treasury, 1967). Cmnd 3437 focused on the requirements of allocative efficiency. It recommended that investments should be assessed on a DCF basis, using a test rate of discount that reflected the social opportunity cost of capital (paras. 6–16) and that prices should be related to long run marginal costs (paras. 17–26). To allocate resources on an efficient basis only pricing and investment criteria are required (Heald, 1980; Lapsley, 1981; and Davies and McInnes, 1982) but Cmnd 3437 also recommended the setting of financial targets (paras. 33–36). Financial targets were to be set in accounting terms and the measurement of outcomes was to be based on the figures in the audited published accounts.

Twelve relatively autonomous Area Boards were set up by the Gas Act 1948. The Act also established a Gas Council whose duties were to advise the Minister on matters relating to the industry and to promote and co-ordinate the activities of the Area Boards. When the industry was nationalised almost all the gas used in the UK was manufactured using coal-based methods. In the early 1960s oil-based manufacturing plants were introduced which could produce the gas more cheaply. However, before the changeover from coal-based to oil-based plants was complete it became apparent that there were considerable supplies of gas under the North Sea and the Government decided to exploit this resource (Ministry of Power, 1967). Thus, in the late 1960s the gas industry started another period of major transition, this time from a mixture of coal-based and oil-based manufacture of gas to the distribution of natural gas. The transition from manufactured gas to natural gas led to the Gas Act 1972 which abolished the Area Boards and the Gas Council and established the British Gas Corporation (BGC) as the monopoly supplier of gas in the United Kingdom. This change of organisational structure for the gas industry was aimed at transferring power to the centre which seemed to be more appropriate for an industry moving towards a position where its prime responsibility would be the distribution of natural gas through a national transmission system (Williams 1981, p. 236).

The gas industry had many of the characteristics that positive accounting theorists (e.g. Hagerman and Zmijewski, 1979, pp. 142–145) have argued increase a firm's political sensitivity: it was large, monopolistic, capital intensive and had highly variable reported profits. According to *The Times 1000* for 1971–72, the median year of the study, the gas industry was large in a UK context: there were only two nationalised industries and three UK private sector industrial companies with a larger capital employed, and two nationalised industries and four companies with larger net profits before interest and tax. Although competing in the energy market the UK gas industry was a monopoly supplier of gas in the UK (National Economic Development Office, Appendix Volume, 1976, p. 20). The UK gas industry appeared to be considerably more capital intensive than the 20 largest UK industrial companies when capital intensity ratios are compared, based on the figures in *The Times 1000* for 1971–72. The capital intensity ratio (expressed as a percentage of capital employed to turnover) of the UK gas industry was 315% compared with an average of 54% for the 20 largest UK industrial companies. The gas industry had highly variable reported profits during the quinquennium (see Tables 1 and 2 in a later section of this paper). In addition, the industry received most of its external finance from the government which may have contributed further to its political sensitivity.

Research approach

The focus of the investigation was derived from the arguments developed earlier that gas industry management might have had incentives to make income-decreasing accounting changes in order to improve the rationale for price rises or to avoid or reduce the imposition of political costs or negative wealth transfers. However, it was recognised that in the particular setting of the UK gas industry during the 1969 to 1974 period there might be other possible incentives for and other potential cash flow consequences of any accounting changes and when these became apparent they were included in the study.

The five years from 1 April 1969 to 31 March 1974 were chosen for the study because the government set the industry a financial target in accounting rate of return terms for that quinquennium. Obviously any accounting changes made during the quinquennium had the potential to impact upon the comparison of the reported outcomes with the financial target. A priori it seemed possible that any accounting changes might have been influenced by their impact on that comparison, particularly as the comparison appeared to have had an influence on the industry's pricing policy (Coopers and Lybrand, 1976).

The accounting changes were identified by examining the published accounts (in particular the notes to the accounts) of the gas industry for each of the five years of the study. The accounting choices used in the published accounts for the year ended 31 March 1969 were used as a benchmark when investigating the accounting changes made during the year ended 31 March 1970. For the first three years of the study it was necessary to examine the consolidated accounts of the Gas Council and the Area Boards as well as the accounts of the Gas Council and those of the twelve Area Boards. For the remaining two years it was only necessary to examine the published accounts of the BGC.

The accounting changes for the first three years were divided into two categories: (i) those made either for the Gas Council or for the individual Area Boards as its request; and (ii) those made for the Area Boards where there was no evidence that they had been made at the request of the Gas Council. It has been assumed that the accounting changes in the second category were made independently by the Area Boards and consequently they have been excluded from the study as the investigation only focuses on the possible incentives to make accounting changes for the gas industry as a whole. It does not investigate the possible incentives of the individual Area Boards.

Holthausen and Leftwich (1983, p. 104) point out that most accounting changes only create timing differences which reverse in some future year. However, over a relatively short period of time such as a quinquennium reversal may not take place. Consequently, in order to assess the full effects of the accounting changes made for the gas industry during the quinquennium, estimates were made of their effects on the reported financial performance for all remaining years of the quinquennium. Finally, estimates were made of the cumulative effect of the accounting changes on both the reported net income and the reported accounting rate of return for each year of the quinquennium.

Brief descriptions of the accounting changes and their overall effects are provided in the next section. Fuller details of both the accounting changes and how their effects were estimated are provided in McInnes (1988).

The search for evidence which might throw light on the incentives for the accounting changes involved inspection of the gas industry's report and accounts and items relating to gas, which seemed relevant given the focus of this study, in the following indexes: the General Index to the Parliamentary Debates; the Government Publications Catalogue; and the Research Index. The General Index to the Parliamentary Debates covers both the Oral Answers and the Written Answers sections of Hansard. The annual Catalogue of Government Publications contains all the items published by HMSO during the year except Statutory Instruments, e.g. House of Commons Papers, Command Papers, House of Commons Bills, Public General Acts, publications by government departments etc. The Research Index is a fortnightly index of articles and news items, mainly of financial interest, which have appeared in about 150 newspaper, business, economic and trade periodicals during the previous two weeks.

Accounting changes and their effects

The financial target set for the gas industry for the quinquennium ended 31 March 1974 was to achieve a net return (surplus and interest but after charges for depreciation) of 7% on average net assets employed. The reported results for the quinquennium are shown in Table 1.

Table 1
Reported Outcomes for the Quinquennium

	1969/70 £m	*1970/71* £m	*1971/72* £m	*1972/73* £m	*1973/74* £m	*Total for five years* £m
Interest	87.7	106.3	124.4	143.2	153.9	615.5
Profit (Loss)	13.7	2.0	15.1	5.6	(41.5)	(5.1)
	101.4	108.3	139.5	148.8	112.4	610.4
Average net assets employed	1566.7	1759.6	1936.7	2033.5	2079.0	—
Net return % (profit and interest)	6.5	6.2	7.2	7.3	5.4	6.5

(*BGC Annual Report and Accounts*, 1973/74, p. 12)

Accounting Changes and Their Effects on Reported Net Income in the Year of Change

All the accounting changes identified and their effects on the reported net income for the year in which the changes were made are shown in Table 2. The multi-period and cumulative effects of the accounting changes will be discussed in the next section. As can be seen from the Table there were eleven accounting changes made during the quinquennium of which ten were income-decreasing. The income-increasing accounting change made in 1969/70 had only a minor effect (+3%) on reported net income. The ten income-decreasing accounting changes were all made during the last three years of the quinquennium and had the effect of reducing reported net income for these three years by 39.4%, 77.9% and 48.8%, respectively.

The income-increasing accounting changes made in 1969/70 were the result of a recommendation by the Gas Council that the Area Boards should transfer all their reserves to a reserve fund. This removed the restriction previously accepted by nine of the Area Boards that only the obsolescence and development reserve could be used for writing off gas manufacturing plant made obsolete as a result of the exploitation of natural gas. The removal of this restriction enabled those Area Boards to increase the amount of obsolete plant (displaced plant) written off against reserves by £8m. If this amount had not been written off against reserves it would have been shown as displaced plant in the balance sheets of the Area Boards and the amounts of displaced plant written off to revenue would have been increased by £0.4m.

Four income-decreasing accounting changes were made in 1971/72. Exploration expenditure which had previously been capitalised and written off on a straight line basis over ten years was now to be written off as incurred. Interest on borrowings relating to new construction work was no longer to be capitalised. Similarly the practice of capitalising a proportion of salaries and related expenses was discontinued. The amortisation of displaced plant previously written off over fifteen years or the unexpired depreciation period of the plant concerned, whichever was the shorter, was now to be accelerated to ensure that all such costs were written off by 31 March 1981.

Table 2
Accounting Changes and Their Effects on Net Income for the Year of Change

	1969/70 £m	*1970/71* £m	*1971/72* £m	*1972/73* £m	*1973/74* £m
Changes relating to displaced plant	0.4				
Accelerated w/o of exploration expenses			(4.6)		
Non-capitalisation of interest			(1.2)		
Non-capitalisation of salaries etc.			(1.0)		
Accelerated amortisation of displaced plant			(3.0)		
Extraordinary charges				(6.7)	
Accelerated amortisation of deferred charges				(11.1)	
Accelerated amortisation of loan expenses				(1.9)	
Changes in various depreciation rates					(9.2)
Non-capitalisation of overheads					(3.5)
Reduction of hire purchase interest earned					(0.9)
Total effect of accounting changes	0.4	—	(9.8)	(19.7)	(13.6)
Reported net income	13.7	2.0	15.1	5.6	(41.5)
Net income before accounting changes	13.3	2.0	24.9	25.3	(27.9)
Percentage change in net income	3.0%	0.0%	(39.4%)	(77.9%)	(48.8%)

Table 3
Estimated Multi-Period and Cumulative Effects of the Accounting Changes Made During the Last Three Years of the Quinquennium on the Reported Net Income for Each of These Years

Accounting changes	*1971/72* £m	*1972/73* £m	*1973/74* £m
1971/72	(9.8)	(11.3)	(24.2)
1972/73		(19.7)	(18.5)
1973/74			(13.6)
Cumulative effect on reported net income	(9.8)	(31.0)	(56.3)

In 1972/73 three income decreasing accounting changes were made. The unamortised balances on two accounts which were established as a result of the terms of the Gas Act 1948 were written off as extraordinary charges. These charges were deducted prior to arriving at the reported net profit of £5.6m shown on Tables 1 and 2. (SSAP6 on Extraordinary Items and Prior Year Adjustments was not published until April 1974.) The costs incurred in converting customers' appliances to natural gas which the gas industry treated as deferred charges and which had previously been written off over fifteen years were now to be written off over seven years. Loan expenses which were previously written off over the period of the loan were now to be written off as incurred.

In 1973/74 the depreciation charge was increased as a result of various unspecified changes in the depreciation rates. Overheads relating to new construction work were no longer to be capitalised. The amount of interest earned on hire purchase and similar transactions was reduced as a result of a change in the method of releasing hire purchase interest to revenue.

Multi-period and Cumulative Effects of the Accounting Changes

The accounting changes made during the year ended 31 March 1970 had an insignificant effect on the reported outcomes for the quinquennium. There were no changes made during the year ended 31 March 1971. However, if the accounting changes made during the last three years of the quinquennium had not been made, the reported results would have been different. The estimated multi-period and cumulative effects of these accounting changes on the reported net income for the last three years of the quinquennium are shown in Table 3 and the estimated multi-period and cumulative effects on the reported return on average capital employed for these years are shown in Table 4.

The accounting changes made during the year ended 31 March 1972 (Table 2) had not begun to reverse by the end of the quinquennium. These changes reduced the reported net income for the last three years of the quinquennium by approximately £9.8m, £11.3m and £24.2m respectively (Table 3) and reduced the reported return on average capital employed for these years by approximately 0.4%, 0.4% and 0.9% respectively (Table 4). The increased decreasing effect of the accounting changes on the reported outcomes for the year ended 31 March 1974 was largely due to the acceleration of the amortisation of displaced plant. During that year very large amounts of gas-manufacturing plant were transferred to the displaced plant account.

Table 4
Estimated Multi-Period and Cumulative Effects of the Accounting Changes Made During the Last Three Years of the Quinquennium on the Reported Return on Average Capital Employed for Each of These Years

Accounting changes	*1971/72* %	*1972/73* %	*1973/74* %
1971/72	(0.4)	(0.4)	(0.9)
1972/73		(0.9)	(0.8)
1973/74			(0.6)
Cumulative effect on reported return	(0.4)	(1.3)	(2.3)
Reported return	7.2	7.3	5.4
Return before accounting changes	7.6	8.6	7.7
Reported average return	6.6	6.8	6.5
Average return before accounting changes	6.8	7.2	7.3

The accounting changes made during the year ended 31 March 1973 (Table 2) had the effect of reducing the net income for the last two years of the quinquennium by approximately £19.7m and £18.5m respectively (Table 3) and of reducing the reported return on average capital employed by approximately 0.9% and 0.8% respectively (Table 4). The decisions to accelerate the amortisation of (1) deferred charges and (2) loan expenses had not begun to reverse during the year ended 31 March 1974 and these had an income-decreasing effect of approximately £20.1 million. Although the other accounting change made during the year ended 31 March 1973 had begun to reverse during the following year, it only increased income by approximately £1.6 million.

Possible incentives and cash flow consequences

None of the Annual Reports and Accounts for the five years of the study contained any direction from the gas industry's sponsor department regarding the accounting changes. The investigation did not identify any evidence which suggested a less formal involvement by civil servants in making any of these changes. Although it is still possible that civil servants were involved in some way, perhaps insisting on being informed in advance of any accounting changes and reserving the right of veto, this section will focus only on the possible incentives of gas industry management to make the accounting changes. This focus is consistent with the evidence provided by the Ministry of Power to the Select Committee on Nationalised Industries (1968) that civil servants leave industry management 'considerable latitude in deciding the precise form in which the accounts are published'.

Three possible incentives for gas industry management to make the accounting changes have been identified: improved justifications for increases in gas prices; increases in the compensation payable for price restraint; and avoidance of wealth transfers to the Treasury. These possible incentives, together with the cash flow consequences of the accounting changes, will now be discussed.

Improved Justifications for Gas Price Rises

The context within which the gas industry's prices were set changed over the five years of the study. This section will provide an outline of each context and then within that context explore the possible incentives for the accounting changes and their cash flow consequences.

The 1967 White Paper (para. 17) stated that the Government's policy on pricing:

> starts from the principle that nationalised industries' revenues should normally cover their accounting costs in full—including the service of capital and appropriate provision for its replacement.

Although the above statement is consistent with the recommendations in the 1961 White Paper (Treasury, 1961) and in the 1965 Fuel Policy White Paper (Ministry of Power, 1965) a change in emphasis became apparent in the paragraphs which followed. For instance, para. 21 stated that:

> In addition to recovering costs, prices need to be reasonably related to costs at the margin and to be designed to promote the efficient use of resources.... In the long run the main consideration is the cost of supplying on a continuing basis...

The relevance of the 1967 White Paper to the gas industry was assessed by the Select Committee on Nationalised Industries (1968a). The SCNI saw the practical question of whether the gas industry should set prices at the level required to meet accounting costs or whether they should relate prices to long-run marginal costs as being of considerable importance and pointed out that the question arose on the charges for the obsolete gas-making plant (Section III.8).

In April 1969 the Minister of Power published his observations (Select Committee on Nationalised Industries, 1969) on the above SCNI report. Accounting costs which were likely to lead to total accounting costs exceeding long-run marginal costs were discussed. It was pointed out that if the costs of obsolete plant did not fall on the gas consumer, they would have to fall on the taxpayer. The Minister could see no justification for such a transfer and argued instead that the departure from marginal cost pricing necessary to recover these costs would be relatively small and would not, in his view, lead to a significant distortion of resource allocation (para. 13). The Minister also indicated (para. 15) that the gas industry would be set a financial objective for the next five years which would enable it to recover its accounting costs, including the amortisation of obsolete plant.

In October 1969 the Ministry of Power announced that new financial objectives had been agreed with the gas industry (*The Times*, 7 October 1969, p. 22) which were that the industry was to earn a net return (surplus and interest but after charging depreciation) of 7% on average net assets employed. However, during the quinquennium the pricing principles outlined above were overtaken by the incumbent Government's concern with the increase in the general level of prices. This concern was reflected in the annual Budget Statements by the Chancellor of the Exchequer (799 HC Deb 1969–70 cols 1224–5, 814 HC Deb 1970–71 cols 1360–1, 833 HC Deb 1971–72 cols 1345–6, 852 HC Deb 1972–73 cols 238–240, 871 HC Deb 1974 cols

282–3). In terms of the Retail Price Index the general rate of inflation had increased from 5.6% in 1968 to 28.8% in 1974 (Annual Abstract of Statistics, 1975, p. 418). Until 1 April 1973, when the Price Commission was formed under the Counter-Inflation Act 1973, the gas industry, as a nationalised industry, had to seek government approval for price increases. As government ministers were seeking price restraint from the private sector they may have felt they had to be seen to be exercising price restraint on those sectors of the economy where price rises were directly in their control. Price rises proposed by the gas industry were either delayed and/or reduced, leading to conflict with gas industry management who were seeking increased cash flows from gas price rises in order to finance the high level of capital expenditure associated with the exploitation of natural gas, increasing demands for gas and high interest rates (BGC Annual Report and Accounts, 1973/74, p. 11).

The first indication during the quinquennium that gas industry management wanted to increase prices came in August 1970 when the Chairman of the industry, Sir Henry Jones, indicated that 'a modest increase' was necessary (*Gas World*, 29 August 1970, p. 168). The magazine stated that:

> Higher prices, to bring in about £25m in a year are likely to be requested in the near future. No application has yet been lodged . . . but the industry is understood to feel that increases are necessary to counter the rise in costs and wages.

At the press conference in October 1970 to present the accounts for the year ended 31 March 1970 the industry's Chairman explained:

> Our present situation is such that we must either increase some prices or fail to meet our financial targets; and this would result in increased borrowing from the government (*Gas World*, 17 October 1970, p. 293).

As the reported outcome was 6.5% (Table 1) there was no need to make income-decreasing accounting changes in order to make the above argument more convincing. In fact accounting changes were made which had a small income-increasing effect (Table 2). In December 1970 the government agreed to an average 6% rise in gas prices (*Gas World*, 19/26 December 1970, p. 503) which the Secretary of State for Trade and Industry, Mr Nicholas Ridley, estimated would bring in additional revenue of £37m (813 HC Deb 1970/71 col 10 Written Answers.)

On 5 May 1971 the *Financial Times* (p. 1) reported that the gas industry had asked the Government for permission to raise prices by an average of between 6 and 7% from mid-summer. According to the *Financial Times*' report these increases were needed to meet the increased costs of raw material and labour and to enable the industry to meet its financial target.

On 14 June 1971 *The Times* (p. 17) reported that because the Government had delayed consideration of the gas industry's application for price rises the Gas Council had abandoned plans to introduce higher tariffs on 1 July. The report pointed out that as it was unlikely that any increases which the Government might approve could be implemented before September or October the gas industry was now going to lose three month's increased revenue which would jeopardise the industry's chances of meeting its financial target.

As a result of the CBI initiative in July 1971 to restrict price rises to 5% to help to counter inflation there was a further threat to the gas industry's hopes of a price rise. In his 'mini-budget' statement on 19 July 1971 (821 HC Deb 1970/71 cols 1037–8) the Chancellor of the Exchequer, Mr Anthony Barber, informed the House of Commons that the chairmen of the major nationalised industries had agreed to accept the same restraint on prices as the private sector members of the CBI. The gas industry was thus pledged to restrict any price rise to 5% in the twelve months to July 1972.

On the day after the press conference to present the industry's 1970/71 published accounts *The Guardian* (13 October 1971, p. 1) reported:

> Sir Henry Jones (the Chairman of the gas industry) . . . revealed that gas bills would have to go up by 5% on January 1 and possibly more later in the year if the industry was to meet its statutory financial target. Sir Henry lays the blame for the industry's failure to meet its financial target squarely at the feet of the Government which, he says, has twice delayed price increases which were necessary to meet the Council's obligations.

There was no need to make income-decreasing accounting changes for the year ended 31 March 1971 to make the above argument more convincing as the reported return was well below the target at 6.2% (Table 1). According to the *Financial Times* (22 November 1971, p. 18) the 5% price rise in January 1972 was expected to bring in £30m but this was not considered sufficient to put the industry back on target.

At the press conference in October 1972 to present the accounts for the year ended 31 March 1972 the industry's new Chairman, Mr Arthur Hetherington, pointed out that a price rise was required as the industry was still about £20m short of the overall surplus necessary to achieve its financial target over the first three years of the quinquennium and as there was still a great need 'to increase the proportion of new capital expenditure which is being met from internal resources' (*Financial Times*, 11 October 1972, p. 36). As can be seen from Table 2 the accounting changes made for the year ended 31 March 1972 had an income-decreasing effect of £9.8m so that almost half the shortfall which the Chairman claimed was necessary to meet the financial target was the result of the accounting changes. As can be seen from Table 4 the accounting changes reduced the reported return for the year by 0.4% from 7.6% to 7.2% and the average return for the first three years of the quinquennium from 6.8% to 6.6%. Thus the income-decreasing accounting changes made during the year ended 31 March 1972 are consistent with the argument that they were made in order to help justify or at least not make more difficult the arguments for future increases in gas prices.

Unfortunately, from the gas industry's point of view, this proposed price rise had to be abandoned because of the general restraint imposed by the Government's Counter-Inflation Programme which led the BGC to argue in its 1972/73 Annual Report and Accounts (p. 12) that:

> The need for an early increase in tariffs still remains if the industry is to maintain a viable financial position.

The accounting changes made for the year ended 31 March 1973 reduced the reported return for the year by 0.9% from 8.2% to 7.3% (Table 4). These changes also ensured that the average return for the four years ended 31 March 1973 was reported below the target at 6.8% (Table 4). As in the previous year these accounting changes are consistent with the argument that they were made to help justify or at least not make more difficult the arguments for a future rise in gas prices. However, there was no evidence of the comparison with the financial target being used to justify a price rise when the accounts were published in September 1973 as by that time the context in which price rises were approved had changed.

In March 1973 the Counter-Inflation Act, which created the Price Commission and defined its powers and functions, received the Royal Assent. The Commission was charged by the Act with ensuring that the provisions of the Price and Pay Code relating to prices and charges were implemented. Although the Commission's powers were derived from the Act, the detailed provisions relating to the Commission's functions appeared in Statutory Orders. The relevance of these Orders to the gas industry is described below:

(1) *The Counter-Inflation (Price and Pay Code) Order 1973 (no 658)*
This was the Order which contained the Price and Pay Code in its final form. Para. 3 described the general principles relating to prices which included the aim of limiting 'the extent to which prices may be increased on account of increased costs'. And para. 16 which turned out to be crucial to the BGC stated that:

> Prices which are within the control may not be increased unless there is an increase in total costs per unit of output. No increase may exceed the increase in total costs per unit.

(2) *The Counter-Inflation (Notification of Increases in Prices and Charges) Order 1973 (no 664)*
This Order required large firms to notify the Price Commission in advance of proposed increases in prices and charges and required the Commission to approve, qualify or reject the proposed increases.

(3) *The Counter-Inflation (Prices and Charges) (Information) Order 1973 (no 778)*
This Order described the obligation on large and medium businesses to submit periodical returns to the Price Commission. Para. 4 of that Order specified that these returns must be reconcilable with the annual accounts.

The Price Commission felt it was important that its role in relation to the Price Code should be clearly understood and in para. 4.2 of its first report (Price Commission, 1973) it stated that:

> The Code gives the Commission no general discretionary powers. It follows that if an application is within the terms of the Code the Commission must allow it. Equally if the application is not within the terms of the Code the Commission must reject it.

On 12 June 1973 the BGC lodged an application for a 5% rise in gas prices from 1 September 1973 which was estimated to bring in £30m a year in additional revenue if accepted (*Financial Times*, 13 June 1973, p. 1). This proposed price rise had been discussed with the civil servants from the Department of Trade and Industry prior to submission, which suggests that it had Ministerial approval (*Gas World*, 14 July 1973, p. 19).

On 6 July 1973 the Price Commission announced that it had rejected the BGC's proposed price rise on the basis that costs per unit in the industry had fallen (*The Guardian*, 7 July 1973, p. 1). According to *The Guardian* report, the BGC 'reacted furiously' and claimed that the price rise had been lost on a 'technicality'. The Corporation was reported as pointing out that the Price Commission had ignored the fact that income per unit had fallen at an even greater rate than costs per unit so that overall the industry was losing money. The BGC claimed that it had pointed out this 'major defect' to the government when the code was first drafted and it understood that this had been recognised. The Corporation was therefore 'greatly surprised and disappointed' that its proposed price rise had been rejected on this basis.

In October 1973 at the press conference to present the BGC's published accounts for the year ended 31 March 1973, the Chairman of the BGC, Mr Arthur Hetherington, was severely critical of the Price Commission for rejecting their proposed price rise in July. He justified the need for a price rise on the basis of the large loss expected for the year ended 31 March 1974.

On 1 November 1973 a new statutory instrument, the Counter-Inflation (Price and Pay Code) (No. 2) Order 1973 (No. 1785) became the basis of Stage 3 of the government's counter-inflation policy. Para. 84 of that Code, which applied only to the gas and electricity industries, stated that:

> Where since the base date the average revenue per unit has fallen faster than the average costs per unit, tariffs may be increased by the amount necessary to restore the cash margin per unit of output to the level which applied at the base date. Where since the base date the average revenue per unit has fallen but average costs per unit have risen, the permissible increase in tariffs may include an element sufficient to restore average revenue per unit to the base date level in addition to an element calculated on the basis of allowable cost increases.

Para. 21 of the Code stated that the base date was 30 April 1973 but where:

> The price of a particular product or of a range of related products has not been increased since 30 September 1972 that date may, at the option of the enterprise, be substituted for 30 April 1973.

As the BGC had not been able to increase its prices since 1 January 1972 it could have opted for 30 September 1972 as its base date if it so desired.

On 26 November 1973 the BGC applied to the Price Commission for an increase in gas prices of approximately 7.5% effective from 1 January 1974 (*Gas World*, January 1974, p. 61). As the submissions to the Price Commission remain confidential it was not possible to ascertain directly which base date was used by the BGC in its price rise application. However, it seems clear from the Financial Surveys included in the Annual Report and Accounts for the years ended 31 March 1973 (p. 12) and 31 March 1974 (p. 11) that, whichever base date was opted for by the BGC, one or other of the situations described in para. 84 would apply. On 21 December 1973 permission for a rise in gas prices was granted. The BGC estimated this price increase would bring in additional revenue of about £55m in a full year (*Financial Times*, 22 December 1973, p. 24).

The Price Commission's decisions on applications for price rises were to be based on information supplied by the applicant organisation which could be reconciled with that organisation's annual accounts. In the BGC's annual accounts for the year ended 31 March 1974 it was either stated or implied that each of the accounting changes noted in Table 2 was made from 1 April 1973. Thus, given the requirements of para. 84 of the Counter-Inflation (Price and Pay Code) (No. 2) Order 1973 (No. 1785), it seems likely that the accounting changes made during the year ended 31 March 1974 had some increasing effect on the size of the price rise awarded in December 1973 no matter which base date was chosen under para. 21 of the Code. Therefore as a result of the accounting changes made during the year ended 31 March 1974 the gas industry may have received a higher cash inflow from the price rise than it would have received had these accounting changes not been made. That higher cash inflow may have provided the motivation for the accounting changes.

Table 5
Gas Prices and Accounting Changes

Year	*Difficulty in justifying a price rise*	*Income decreasing accounting changes*
1969/70	No	No
1970/71	No	No
1971/72	Yes	Yes
1972/73	Yes	Yes
1973/74	Yes	Yes

The findings of this section for the five years of the quinquennium are summarised in Table 5.

Finally, it seems likely that the 1971/72 and 1972/73 accounting changes, which increased the BGC's total costs for 1973/74 by approximately £24.2m and £18.5m respectively (Table 3) may also have increased both the size of the price rise awarded in December 1973 and the resulting additional cash inflows. Thus these accounting changes may ultimately have achieved their objectives but later than originally intended and in a quite different context for the approval of price rises.

Increases in Compensation for Price Restraint

In order to compensate certain statutory corporations for the financial losses they had incurred in the early seventies as a result of compliance with the national policy relating to price limitations, the Government introduced the Statutory Corporations (Financial Provisions) Bill. The Bill received its First and Second Readings in November 1973, its Third Reading in January 1974 and in February 1974 the Statutory Corporations (Financial Provisions) Act 1974 received the Royal Assent. The gas industry was one of the organisations specified in the Act. Details of the effects of price restraint on the gas industry's requests for price increases have been described in the previous section.

Section (1) of the Act specified that compensation for price restraint should be paid to the BGC equal to any deficits on the revenue accounts of the Area Boards for the years ended 31 March 1971, 1972 and 1973. Schedule 1 to the Act specified that £33.4m be paid to the BGC as compensation for those losses. If the 1971/72 and 1972/73 accounting changes which decreased the income of the Area Boards[3] had not been made, the relevant Area Boards' reported losses for these years would have been smaller and therefore the compensation received by the BGC would have been less than £33.4m. Thus some of the 1971/72 and 1972/73 accounting changes had cash flow benefits to the industry in that they must have increased the amount of compensation received by the BGC for these years. As the relevant legislation described above was introduced retrospectively these cash flow benefits from the accounting changes could not have been anticipated by management. It was not possible to calculate the exact amount by which the 1971/72 and 1972/73 accounting changes increased the compensation of £33.4m because the 1972/73 accounts published by the BGC did not include the necessary details relating to the Area Boards.

Section (2) of the Act specified that the BGC should receive compensation equal to any financial loss reported by the corporation for the years ended 31 March 1974 and 1975. Thus BGC management had incentives to make accounting changes which would increase any reported loss for the year ended 31 March 1974 in order to increase the compensation payable. As Table 2 shows the 1973/74 accounting changes increased the reported net loss for that year by £13.6m from £27.9m to £41.5m. The amount of compensation paid to the BGC was £41.5m. Thus the 1973/74 accounting changes had direct cash flow benefits to the BGC.

The 1971/72 and 1972/73 accounting changes also had an effect on the compensation paid to the BGC for the year ended 31 March 1974. As Table 3 shows, the 1971/72 and 1972/73 accounting changes decreased the 1973/74 reported income by £24.2m and £18.5m respectively, so that the cumulative effect of the accounting changes made for the three years ended 31 March 1974 was to decrease the 1973/74 reported income by £56.3m. Thus, if these accounting changes had not been made the gas industry would not have reported a net loss of £41.5m but would instead have reported a net surplus of approximately £14.8m. Had this been the case the industry would not have been able to claim any compensation for price restraint under Section (2) and as a result the industry's future cash inflows would have been reduced by £41.5m. Thus the accounting changes made during the last three years of the quinquennium had direct and beneficial cash flow consequences for the industry.

Avoidance of Wealth Transfers to the Treasury

From January to May 1972 gas industry management were no doubt concerned about Clause 16 of the Gas Bill 1972 which stated that:

> If in any financial year of the Corporation there is an excess of the revenue of the Corporation over the total sums properly chargeable by them to revenue account, the Secretary of State may with the approval of the Treasury direct the Corporation to pay over to him so much of that excess as appears to him after consultation with the Corporation, to be surplus to their requirements; and it shall be the duty of the Corporation to comply with any such direction.

The Minister for Industry justified Clause 16 on the basis that in the future really large finds of natural gas might generate exceptionally high profits and that it would not necessarily be right for these to accrue wholly to the industry (829 HC Deb 1971/72 col 1645). Nevertheless, Clause 16 caused considerable controversy during the Second Reading (829 HC Deb 1971/72 cols 1669–1701).

In May 1972 Clause 16 of the Gas Bill 1972 was discussed at the Standing Committee stage (HC Standing Committee B 1971/72 Vol. II cols 829–862). During the discussion a non-government politician, Mr Alex Eadie, claimed that:

> It is no secret that the whole gas industry is appalled by the Bill and that the officials in charge of the industry are appalled by this Clause (col 840).

Mr Eadie's comment seems to indicate that the civil servants in the sponsor department were on the side of the industry on this matter. However, the government's amendment to Clause 16 (cols 829–830) only gave the Government the power to make a wealth transfer from the new Corporation to the Treasury provided the Corporation's reserves exceeded 10% of its net assets. The Minister for Industry attempted to establish the reasonableness of the new Clause 16 by pointing out that at 31 March 1971 the industry's net assets stood at over £1,800m which meant that reserves would have to grow to £180m before the Government's powers under Clause 16 came into effect (col 853).

---

[3] The only 1971/72 accounting change which was made in the accounts of the Area Boards was the accelerated amortisation of displaced plant. The other 1971/72 accounting changes were made in the accounts of the Gas Council. The 1972/73 accounting changes which related to items previously shown in the accounts of the Area Boards were the extraordinary items written off and the accelerated amortisation of deferred charges. Loan expenses had previously been shown on the balance sheet of the Gas Council.

According to the Minister (col 857) the industry's reserves were only £6.6m in 1971. The new Clause 16 was accepted (cols 861–864) and in August 1972 it became Section 16 of the Gas Act 1972. Thus the immediate threat of a wealth transfer from the Corporation to the Treasury was removed.

As it is not clear exactly when the accounting changes for the year ended 31 March 1972 were made, it is also difficult to establish whether the original Clause 16 of the Gas Bill 1972 formed part of the context in which the changes were made. Even if Clause 16 did provide the context, gas industry management would have known that, if it was incorporated unchanged into the Gas Act, it could not have led to a negative wealth transfer based on the published accounts for 1971/72. It would only have had that potential after the formation of the new Corporation. However, as Table 3 shows, the 1971/72 accounting changes did have a major decreasing effect on the reported net income for both 1972/73 and 1973/74. Gas industry management would probably have been aware that the income-decreasing accounting changes made in 1971/72 would continue to have an income-decreasing effect until the effect of the timing differences resulting from accounting changes began to reverse.

Conclusions

The focus of this study on the accounting changes made by only one organisation over a relatively short period of time means that, in the absence of any direct evidence on the causal links, causality cannot be ascertained. Nevertheless, the study has provided evidence which is consistent with the argument derived from the positive accounting literature that when there were incentives to provide an improved justification for a price rise in order to increase the gas industry's cash inflows, income-decreasing accounting changes were made and where these incentives did not exist income-decreasing accounting choices were not made. This finding is interesting given that the original argument was developed with US regulated firms in mind where both the regulatory framework and the institutional arrangements are different from those in the UK. Until the introduction of Price Codes in 1973 the regulation of gas prices in the UK was much looser than that for a regulated firm in the US where rate of return regulation means that price rises can only be allowed provided the requirements of a rate of return formula are met. In spite of the regulatory and institutional differences between the UK and the USA, and in spite of the changes in the UK regulatory system which took place during the quinquennium, this study provides evidence which is consistent with the arguments relating to regulated firms in the USA and with the findings of Jarrell (1979) which is the only other empirical study of the effect of price regulation on accounting.

Most of the empirical studies by positive accounting researchers are cross-sectional. This is the first longitudinal study of the accounting changes made by one organisation and it is, therefore, the first study which provides estimates of the multi-period monetary effects of accounting changes. Thus, it is the first study which demonstrates that accounting changes can have major effects not only on the reported outcomes for the year in which the changes were made but also on the reported outcomes for subsequent years. Through a more in-depth investigation than is possible with a large cross-sectional study it has also been possible to demonstrate that accounting changes can have cash flow consequences not only in the year in which the changes were made but also in subsequent years. To the extent that both the current and future cash flow consequences can be predicted by managers there may be greater incentives to make accounting changes than has so far been argued by positive accounting theorists.

For instance, to the extent that gas industry management was able to predict that the 1971/72 and 1972/73 accounting changes would have an income-decreasing effect on the subsequent years of the quinquennium, the changes might have been made not only to provide a stronger argument for a price rise based on the reported outcomes for the year of the accounting change but also to provide a stronger argument for a price rise based on the reported outcomes for the subsequent years of the quinquennium. The evidence in the study suggests that both the size of the price rise awarded in December 1973 and the resulting additional cash inflows were probably increased to some extent by the effect of the 1971/72 and 1972/73 accounting changes. Furthermore, to the extent that gas industry management was able to predict that the 1971/72 accounting changes would have an income-decreasing effect on the subsequent years of the quinquennium the changes might have been made so as to reduce the size of any wealth transfers to the Treasury which would have arisen if Clause 16 of the Gas Bill 1972 had been enacted in the Gas Act 1972.

Positive accounting theorists imply that opportunistic behaviour underpins managers' accounting choices. This study provides evidence that accounting changes can have cash flow consequences which could not have been foreseen by management. Although the Statutory Corporations (Financial Provisions) Act 1974 provided a possible incentive for BGC management to make accounting changes in 1973/74 which would increase the reported loss for that year in order to increase the amount of compensation for price restraint payable to the BGC, no such incentives could have existed for the 1971/72 and 1972/73 accounting changes. These changes were made before the First Reading of the Statutory Corporations (Financial Provisions) Bill. Nevertheless the evidence in this study indicates that the compensation for price restraint granted to the BGC for 1971/72, 1972/73 and 1973/74 must have been increased by the 1971/72 and 1972/73 accounting changes. These cash flow consequences could not realistically have been anticipated when the accounting changes were made.

An advantage which this in-depth longitudinal study has over the cross-sectional studies is that it has been possible to investigate all the accounting changes made during the quinquennium. So far the preponderance of empirical studies by positive accounting researchers focus on only one accounting choice. According to the theoretical framework which underpins these studies most firms probably face conflicting pressures from the contracting and political processes. Therefore they probably do not opt for extreme income-increasing or income-decreasing accounting choices. Thus a single accounting choice may not be representative of a firm's other accounting choices. Studies which focus on a portfolio of choices (e.g. Zmijewski and Hagerman, 1981) are obviously more powerful than the single choice studies. The evidence in this study that when there were incentives to make income-decreasing accounting choices (i.e. during the last three years of the quinquennium) all ten of the accounting changes made were income-decreasing is consistent with Zmijewski and Hagerman's findings which suggest that a firm's accounting choices are not made independently.

A limitation of the research approach adopted in this study is that there may have been other possible incentives for the accounting changes which the investigation failed to identify. One alternative explanation for the accounting changes is that they were made to reflect economic reality. However, both the number of income-decreasing changes in the last three years of the quinquennium and the significance of their effects somewhat undermines the plausibility of this explanation. A further limitation of the research approach is that in the absence of direct evidence it is not possible to draw causal inferences with any certainty. Consequently, the evidence is described as being only 'consistent with' the arguments of the positive accounting theorists. Nevertheless, a longitudinal study of accounting change such as this which investigates in detail both the effect of the accounting changes and the possible incentives for making them would appear to complement the large cross-sectional studies of accounting choices in which the effect of the accounting choices and the explanatory variables are inevitably crudely measured.

References

Aharoni, Y. (1981), 'Managerial Discretion' in Vernon, R. and Y. Aharoni (eds.), *State-Owned Enterprise in Western Economies* (Croom Helm), pp. 184–193.

Coopers and Lybrand Associates Limited (1976), 'Review of the Pricing Policies, Investment Criteria and Financial Objectives of Four Nationalised Industries', in National Economic Development Office, Appendix Volume, pp. 95–117.

Davies, J. R. and W. M. McInnes (1982), 'The Efficiency and the Accountability of UK Nationalised Industries', *Accounting and Business Research* (Winter), pp. 29–41.

Fama, E. F. (1980), 'Agency Problems and the Theory of the Firm', *Journal of Political Economy* (Vol. 88, No. 2), pp. 288–307.

Hagerman, R. L. and M. E. Zmijewski (1979), 'Some Economic Determinants of Accounting Policy Choice', *Journal of Accounting and Economics* (August), pp. 141–161.

Heald, D. (1980), 'The Economic and Financial Control of UK Nationalised Industries', *Economic Journal* (June), pp. 243–265.

Holthausen, R. W. and R. Leftwich (1983), 'The Economic Consequences of Accounting Choice: Implications of Costly Contracting and Monitoring', *Journal of Accounting and Economics* (August), pp. 77–117.

Jarrell, G. A. (1979), 'Pro-Producer Regulation and Accounting for Assets: The Case of Electric Utilities', *Journal of Accounting and Economics* (August), pp. 93–116.

Lapsley, I. (1981), 'The Role of Accounting Measures in the Financial Regulation of UK Nationalised Industries', Accounting Research Workshop Paper (University of Glasgow).

Likierman, A. (1983), 'Evidence on Accusations of Manipulating Profitability: Adjustments for Inflation by the Nationalised Industries 1976–81', *Accounting and Business Research* (Winter), pp. 29–34.

Likierman, A. (1985), 'Nationalised Industries', in Henley, D., C. Holtham, A. Likierman and J. Perrin, eds, *Public Sector Accounting and Financial Control* (Van Nostrand Reinhold).

McInnes, W. M. (1988), 'The Effect of Accounting Changes on Reported Financial Performance: The UK Gas Industry 1970–1974', Department of Accounting and Finance Working Paper No. 88/009 (University of Strathclyde).

Ministry of Power (1965), *Fuel Policy*, Cmnd 2798 (HMSO).

Ministry of Power (1967), *Fuel Policy*, Cmnd 3438 (HMSO).

National Economic Development Office (1976), *A Study of UK Nationalised Industries* (HMSO).

Price Commission (1973), *Report for the Period 2 April to 31 May 1973, Session 1973/74* (HMSO).

Select Committee on Nationalised Industries (1968), *Ministerial Control of the Nationalised Industries, Session 1967–68, HC 371* (HMSO).

Select Committee on Nationalised Industries (1968a), *Exploitation of North Sea Gas, Session 1967–68, Second Report, HC 372* (HMSO).

Select Committee on Nationalised Industries (1969), *The Exploitation of North Sea Gas, Observations by the Minister of Power*, Cmnd 3996 (HMSO).

Treasury, H. M. (1961), *The Financial and Economic Obligations of the Nationalised Industries*, Cmnd 1337 (HMSO).

Treasury, H. M. (1967), *Nationalised Industries: A Review of Economic and Financial Objectives*, Cmnd 3437 (HMSO).

Watts, R. L. and J. L. Zimmerman (1986), *Positive Accounting Theory* (Prentice-Hall).

Williams, T. I. (1981), *A History of the British Gas Industry* (Oxford University Press).

Zmijewski, M. and R. Hagerman (1981), 'An Income Strategy Approach to the Positive Theory of Accounting Standard Setting/Choice', *Journal of Accounting and Economics* (August), pp. 129–149.

Volume 3
Number 1
1990

Editors
James E. Guthrie and Lee D. Parker

Accounting Auditing & Accountability Journal

CONTENTS

Abstracts and Keywords

Editorial

***Ad Hoc Manuscript Referees* 1989**

Accounting and Organisation Change
Anthony G. Hopwood

External Management Auditing of Companies: A Survey of Bankers
John Innes

Comparison of Social Responsibility Information Disclosure Media Used by Canadian Firms
Daniel Zéghal and Sadrudin A. Ahmed

Agency, Auditing and the Unregulated Environment: Some Further Historical Evidence
Patti A. Mills

Book Reviews

Subscription enquiries to:

Andrea Stowe, MCB University Press Ltd.,
62 Toller Lane, Bradford, England
BD8 9BY
Tel: 0274 499821 Telex: 51317 MCBUNI G
Fax: 0274 547143
ISSN 0951-3574

Accounting and Business Research, Vol. 20, No. 80, pp. 329-336, 1990

Accounting Standards and the Judiciary

G. W. Radcliffe*

Abstract—The aim of this paper is to assess by means of a study of decided cases the evidential weight attached by the courts to Statements of Standard Accounting Practice (SSAPs) and the status of their provisions relative to statutory accounting rules. This issue is discussed with reference to the accounting requirements of both the Companies Act and the Taxes Act. The extent to which non-statutory accounting principles have acquired the status of binding precedents is also considered. The study reveals that SSAPs have considerable persuasive value as evidence of accounting practice but that expert evidence has not been rendered redundant. There is considerable evidence that the courts regard the determination of accounting principles as a question of fact rather than law where statutory provisions are not in point.

The enactment of the Companies Act 1981 marked the introduction of statutory rules in relation to accounting principles and formats of accounts. Detailed rules on the form and content of accounts are now prescribed in Schedules 4 and 4A of the Companies Act 1985.[1] As White (1987) observes, company law has 'moved to accounting measurement rather than mere disclosure'. The role of standards established by the accountancy profession in that measurement was recognised for the first time in the Companies Act 1989. However no definition of the 'true and fair view of the state of affairs' and 'profit or loss' (TFV) required by Section 226 appears in the Companies Act.

The Income and Corporation Taxes Act (1988) similarly fails to define the 'profits or gains of the year' (PGY) which Section 60 prescribes as the measure of trading profit for tax purposes (though the Act does contain precise rules for adjusting those profits). Thus it has been left to the judges to establish criteria for determining compliance with these statutory provisions. The aim of this study is to assess by reference to decided cases the weight attached to accounting standards (SSAPs) in arriving at these criteria.

Companies Act definition

Palmer's Company Law (1987) (p. 1053) identifies four classes of requirement applying to the form and content of accounts:

(1) the statutory TFV requirement;
(2) specific statutory requirements as to disclosure, format and accounting principles;
(3) accounting standards (SSAPs); and
(4) Stock Exchange requirements for companies listed or dealt in.

The only guidance in the statute as to the relative importance of these criteria is to be found in Sections 226 and 227 which recognise the primacy of the TFV requirement in two respects. First, where additional information is necessary to ensure compliance with the requirement, Sections 226 (4) and 227(5) require that this be provided in the accounts or notes. If in special circumstances compliance with the specific statutory rules is inconsistent with the TFV requirement, Sections 226(5) and 227(6) require departure from those rules with an explanation by way of note. However there is now no general rule that the TFV requirement overrides all other statutory provisions on the content and form of accounts and notes, since sub-section (3) of the former Section 228 of the 1985 Act which contained a statement to this effect is not re-enacted by the Companies Act 1989.

Beyond this the statute is of little assistance in ranking the four classes of requirement, though there are references both to accounting standards and to accepted accounting principles. Accounting standards are defined in Section 256 as 'statements of standard accounting practice issued by such body or bodies as may be prescribed by regulation'. There is also provision for grants to bodies concerned with issuing and directing the issue of such standards, investigating departures from them and from statutory accounting requirements, and taking steps to ensure compliance with them. Paragraph 36A of Schedule 4 requires a note stating whether the accounts have been prepared 'in accordance with applicable accounting standards' and giving details of any material departure with an explanation. (Small and medium-sized companies are exempt from this requirement.) Section 262(3) establishes that 'realised profits' are to be determined by reference to accounting

---

*G. W. Radcliffe is a lecturer in the School of Finance and Information, Queen's University of Belfast.

[1] All references to the Companies Act 1985 are to that Act as amended by the Companies Act 1989.

'principles generally accepted' at the time when the accounts are prepared. The section also provides that other expressions may be construed 'where appropriate' by reference to 'accepted accounting principles or practice'. Finally, paragraph 2(1) of Schedule 4A refers to such adjustments to consolidated accounts 'as may be appropriate in accordance with generally accepted accounting principles or practice'.

Thus two related issues remain unresolved, namely the extent to which SSAPs determine TFV, and the relative importance of SSAPs and statutory requirements where the two conflict. The first issue has been widely debated and there is general acceptance of Counsel's opinion (ASC 1983) that TFV is a 'legal concept and the question of whether company accounts comply ... can be authoritatively decided only by a court'. There is also general agreement with Tweedie and Kellas (1987) that 'custodianship of the [TFV] concept' may nevertheless remain with accountants 'provided the profession is agreed on the treatment to be used in a particular case'; thus the more definite the accounting standard the more persuasive it will be as evidence.

Primacy is accorded to TFV not only by statute but also by the Explanatory Foreword to Standards which envisages that departure from SSAPs may be necessary to arrive at the concept. As Storrar (1988) observes, this has led many writers to treat TFV as 'a mysterious almost transcendental ideal' which may be achieved only by the exercise of accountants' professional judgement. On the other hand Rutherford (1985) argues cogently for the adoption of an interpretation of TFV based on compliance with generally accepted accounting principles (GAAP) which he sees as rules of a higher order than SSAPs. He finds authority for this view in the judgement in the Associated Portland Cement case[m] but nevertheless recognises the 'inherent danger that the courts might not accept this'. Counsel's opinion (ASC 1983) is that the meaning of true and fair is a question of fact which the judge will decide on the basis of whether the information contained in accounts 'is sufficient in quantity and quality to satisfy the reasonable expectations of the readers to whom they are addressed'. Since the expectations of readers are moulded by accountants, non-compliance with any SSAP will create a prima facie presumption that accounts are not true and fair.

Discussion of the second issue has centred on apparent inconsistencies between statutory provisions and the requirements of SSAPs on matters such as the treatment of controlled non-subsidiaries and off-balance sheet finance. Often the point at issue is whether accounts should recognise the economic substance of the transaction as recommended by the SSAP rather than its legal form as required by statute. The primacy of SSAPs (being determinants of TFV) is acknowledged in Palmer (1987) in relation to the perceived conflict between the inclusion of profit in long-term contract work-in-progress in accordance with SSAP 9 but contrary to Schedule 4, paragraph 22 of the Act.[2] Counsel's opinion (ASC 1983) is to the same effect and includes the observation that since the provisions of Schedule 4 are static while the overriding TFV concept is dynamic it is not impossible that future SSAPs will render obsolete some of the provisions of the Schedule.

In a statement (DOT 1982) issued after the Argyll Foods case[d] the Department of Trade (DTI) also accepts the primacy of TFV but considers it 'axiomatic that any emphasis on substance over form must not be at the expense of compliance with the law'. Thus compliance with the statutory disclosure requirements would be a prerequisite of TFV. As Ashton (1986) observes, the DTI appears to believe that it will always be possible to devise a reporting format which simultaneously satisfies both the TFV requirement and the statutory disclosure rules.

Under the Companies Act 1989, SSAPs have not been granted the force of statute but they have acquired legal standing for the first time. This may lead the courts to regard them as quasi statutes and to construe their terms accordingly. Further inconsistencies with statutory provisions may be revealed similar to those identified in SSAP 2 by Instone (1985). Noke's (1989) argument that Instone 'attached too much significance to the precise wording of SSAP 2 which was never intended to be construed as a statute' may no longer be tenable.

Taxes Act definition

There is a considerable body of literature and jurisprudence on the relationship between law and accountancy practice in determining PGY. *Tiley's Revenue Law* (1978) (p. 295) identifies two distinct approaches. 'One asserts that the court should first look to see what accountancy says and then see whether any rule of law contradicts it; the other that the court should first determine the question as a matter of law and then see whether accountancy gives a different answer and then determine which should prevail'. There is judicial support for both views. The following dictum of Lord Clyde in the Lothian Chemical case[3] may be cited as evidence of the primacy of accounting principles:

> But where these ordinary (accounting) principles have not been invaded by statute they must be allowed to prevail.

---

[2] Nevertheless the Standard was revised in September, 1988 to remove the apparent conflict with the statutory provision by requiring companies to treat any excess of recorded turnover over payments on account on long-term contracts as a debtor.

[3] Lothian Chemical Co. Ltd. v. Rogers, H. L. (1926) 11 TC 508.

Conversely Lord Denning emphasised the primacy of the law as follows in the P–E Consulting Group case:[4]

> Their [accountants'] practice should be given due weight; but the courts have never regarded themselves as being bound by it. It would be wrong to do so.

There is general agreement that accounting principles are relevant to the determination of PGY though various formulations have been used by the courts, including 'ordinary principles of commercial trading',[5] 'ordinary principles of commercial accounting',[6] 'correct principles of commercial accountancy'[7] and 'established principles of sound commercial accounting'.[8] It is also agreed that where an express statutory provision requiring adjustment of profit is in point, this will be applied by the court. An example of such a provision is Section 577 dealing with the deductibility of business entertaining expenses. But the issue of the extent to which the determination of PGY is a question of law remains unresolved.

Burgess (1972) acknowledges the right of the court to choose between competing systems of accountancy but considers that this choice does not raise a substantive point of law so that a precedent is not created. More recent opinion however is to the contrary. Thus Tiley (1978) points out that the courts have treated these issues as matters of law by ruling on questions where there is no express statutory provision such as the 'correct' method of valuing stock in trade[9] 'even though accountancy knows of many methods'. He disapproves of this approach, arguing that questions of accountancy practice should be treated as questions of fact not law 'thus avoiding the deadening hand of the doctrine of precedent'. Arnold (1983) also concludes that the view that the determination of PGY is 'a question of law to be decided with due regard to any accounting evidence seems to have become the accepted view of the English courts'. Freedman (1987) sees the early judicial references to 'commercial trading' as evidence that the courts were 'searching for the meaning ordinary businessmen would give to the word profits' and were not construing the word in a technical sense where expert evidence would be admissible as on a question of fact. She concludes therefore that, since the meaning of an ordinary word is the subject of judicial notice, PGY has acquired a legal meaning by the doctrine of precedent. Thus certain legal principles have evolved which would not be affected by any conflicting provision in a future SSAP; an example is the rule that neither profit nor loss may be anticipated referred to by Warner, J. in Symons v. Weeks.[i]

A second issue which has received less attention concerns the importance of SSAPs relative to other accountancy evidence in determining accounting principles. Pagan (1984) discusses with reference to SSAP 20 the circumstances in which accounts not prepared in accordance with a Standard may nevertheless conform to the 'ordinary principles of commercial accounting'. She concludes that it is not easy to displace a published SSAP but it is possible if it can be shown that the Standard is controversial, that it is not wholly appropriate for the particular activity under scrutiny and that reputable accounting firms are in those circumstances accepting accounts not in accordance with the Standard.

Methodology and aims of study

Using a legal database all 38 decided cases in which the key words 'accounting' and 'standard' appear in close proximity in the Reports were identified. After examination of the Reports cases in the following categories were excluded from the study:

1. Lands Tribunal decisions.
2. VAT Tribunal decisions.
3. Cases in which the key words in the Report do not refer to SSAPs.
4. Cases in which the key words, although describing SSAPs, represent an insignificant passing reference.

One unreported decision of the Penarth Magistrates, the Argyll Foods case, was included because of its importance and because a detailed analysis of the case is available (Ashton, 1986).

The resulting thirteen decisions are listed in Appendix 1 along with the SSAP(s) discussed in each case. Five cases concern the Companies Act definition, seven the Taxes Act definition and one the expression 'generally accepted accounting principles' contained in paragraph 28 of the now repealed Counter-Inflation (No. 2) Order (1973). (In cases where Exposure Drafts (EDs) are cited, no Standard on the relevant topic having been published when the case was heard, the present SSAP is shown alongside the relevant ED.) The frequencies of citation of various Standards in the Reports are tabulated in Appendix 2 and reveal a wide spread. Not surprisingly, SSAP 2 dealing with fundamental accounting concepts, bases and policies is cited most frequently.

---

[4] Heather v. P-E Consulting Group Ltd., C.A. (1972) 48 TC 293.

[5] Gresham Life Assurance Society v. Styles, H. L. (1890) 2 TC 633.

[6] Ostime v. Duple Motor Bodies Ltd., H. L. (1961) 39 TC 537.

[7] Odeon Associated Theatres v. Jones, C. A. (1971) 48 TC 257.

[8] Odeon Associated Theatres v. Jones, C. A. (1971) 48 TC 257.

[9] MNR v. Anaconda American Brass Co. Ltd., P.C. (1956) AC 85.

The following questions were considered in relation to each case:

(1) Was the SSAP considered sufficient evidence of accounting principles or was other evidence adduced?
(2) What relationship was established by the court between the accounting rules prescribed by the Companies Act or Taxes Act and the provisions of SSAPs?
(3) Does it appear that the court considered the determination of accounting rules for TFV or PGY a question of law rather than fact?

The results are discussed below.

SSAPs as evidence of accounting principles

Companies Act Cases

There is substantial discussion of SSAPs as evidence in only two of the Companies Act cases, Prudential Assurance[e] and Lloyd Cheyham.[c]

In the Prudential case Vinelott, J. considered both the provisions of SSAP 1 and evidence from published accounts in determining the appropriate accounting treatment of results of associated companies. The Standard provided only that information regarding tangible and intangible assets of associated companies should be given by way of note 'if materially relevant'. Nevertheless, having heard expert evidence on the accounting policies of several large public companies, Vinelott, J. acknowledged (at p. 849) that 'there may be exceptional circumstances which justify bringing a share of the underlying assets of associated companies into consolidated accounts'. He agreed however that it was 'dangerous to draw conclusions from published accounts alone without making investigation into the reasons for a particular accounting treatment'.

In Lloyd Cheyham the plaintiffs based their argument that a provision for depreciation of tyres on trailers let on hire was inadequate on an alleged breach of the accruals and prudence concepts laid down in SSAP 2. Woolf, J. did not seek evidence from published accounts as to the practices of other companies but, after hearing expert evidence on the meaning of the accruals and prudence concepts, accepted the defendants' view that the costs involved were not identifiable with sufficient precision to justify a provision. In considering the prudence concept he arrived at the rather surprising conclusion (at p. 319) that the word 'liabilities' in the SSAP was 'capable of being reasonably treated by responsible auditors as referring to legal liabilities' so that by implication no provision was necessary in respect of other liabilities.

The judgement of Woolf, J. in Lloyd Cheyham provides the most recent judicial statement on the evidential importance of SSAPs:

> While they [SSAPs] are not conclusive ... and they are not ... rigid rules, they are very strong evidence as to the proper standard which should be adopted.

This is perhaps a more forthright statement of their importance than Vinelott, J.'s observation in the Prudential case:

> The standards prescribed are not intended to be a comprehensive code of inflexible rules but they are intended as more than a guide or indicator of practice.

Taxes Act Cases

There is no judicial comment in the Taxes Act cases on the specific question of the evidential weight to be attached to SSAPs in determining the 'principles of commercial accounting' used to compute PGY.

However, their significance as determinants of PGY is most clearly demonstrated by the Woolworth[f] and Woodall-Duckham[k] decisions in which changes in accounting policy were accepted as justified by recommendations in recently published EDs or SSAPs. Until 1975 the Woolworth company had treated exchange losses on foreign currency loans as charges against capital reserves but after that date dealt with them through the profit and loss account. Expert evidence that this treatment was approved by ED 16 issued in September, 1975 was accepted by the commissioners as sufficient justification for the change. Hoffmann, J. agreed, speaking of 'a shift of opinion among accountants' (though he in fact rejected the treatment because of an overriding statutory provision). Institute Recommendation N 22 was similarly important evidence justifying a change to an accrued profit basis for valuing work in progress in Woodall-Duckham.

The volume of evidence supplementary to SSAPs adduced in the cases is not great. In RTZ Oil and Gas[h] published accounts of oil companies and a US accounting standard (SFAS 19) were accepted as evidence of correct practice in relation to provision for abandonment costs by companies in the mineral extraction industry, a subject not dealt with in any UK SSAP published at the time. In two cases, Wimpey[g] and Computer Time International,[i] the judge drew attention to a lack of evidence of accountancy practice though relevant provisions of SSAPs had been cited. The correct accounting treatment of rent received in advance was in issue in the Computer Time case and, having heard evidence of the accruals concept described in SSAP 2, Goff, L. J. nevertheless concluded (at p. 646):

> There is no finding by the Commissioners whether there is any established [accounting] practice, or practices, and if more than one,

> whether any particular one is to be preferred, either generally or in relation to this case.... In the absence of any such finding, and with no company accounts to establish a pattern, I do not see how we can reject Mr Whiteman's submission.

In the Wimpey case Harman, J. criticised expert accountancy evidence on SSAP 12 and other matters in the following terms:

> The evidence by the accountants was not evidence, such as one might have expected to find, of a general practice of accountants in dealing with accounts of companies in this trade; it was not evidence of trade practice (if 'trade' is a proper definition of accountancy).

Counter Inflation Order Case

The relative weight of SSAPs as evidence was directly in issue in the Associated Portland Cement case[n] where the meaning of GAAP was discussed. Both Donaldson, J. in the High Court and Lord Denning, M.R. in the Court of Appeal asserted unequivocally that the test was whether a particular accounting base was generally recognised by the accountancy profession and not the extent of its use by businesses in practice. Lord Denning stated (at p. 39):

> It seems to me that the phrase [GAAP] means 'generally approved accountancy principles'. It means principles which are generally regarded as permissible or legitimate by the accountancy profession. That is sufficient even though only one company applies it in practice.

The logical conclusion to be drawn from this statement is that the application of any accounting base recognised in any SSAP is a sufficient condition for compliance with GAAP.

Relationship between provisions of SSAPs and statutes

Companies Act Cases

The primacy of TFV over the accounting rules in Schedules 4 and 4A of the Companies Act is clearly established by the statute and is not disputed in the cases. But there is no clear judicial acknowledgement of the consequence that accounting rules in SSAPs as primary determinants of TFV will therefore override the statutory accounting rules in the event of conflict. Instead TFV is seen as overriding the SSAPs themselves.

Thus Vinelott, J. stated in the Prudential Assurance case (at p. 848):

> They [SSAPs] must, of course, be read subject to the overriding requirement that accounts must be so presented as to give a true and fair view of a company's affairs.

In the same case he implied equality of status between SSAPs and the statutory rules when he stated (at p. 849) that the provisions of SSAP 1 'overlap (and must not be read as derogating from) the provisions introduced by paragraph 5A of Schedule 2 to the Companies Act 1967'.[10]

The relative status of TFV, SSAP rules, and statutory rules was the central issue in the widely reported Argyll Foods case in which the magistrates rejected the defence contention that the company's accounts satisfied the TFV requirement despite their admitted failure to comply with Sections 150 and 154 of the Companies Act 1948[11] and SSAP 14. The court's finding was that the directors of the company had contravened the two Sections of the Act by including in the consolidated accounts the assets of a company which was not a subsidiary at the balance sheet date. Since the breach of SSAP rules was not mentioned although discussed at length during the proceedings, it may be inferred that the court did not regard this as decisive. Rather, the magistrates appeared to regard compliance with the statutory disclosure requirements as the essential component of TFV.

The Thorn EMI case[a] concerned a petition by the company seeking confirmation of a reduction in share premium account with the primary objective of creating a reserve for writing off goodwill on consolidation. Harman, J. discussed and indeed criticised the provisions of SSAP 22 at great length but did not judge it necessary to consider the statutory accounting rules for goodwill. Thus by implication he accorded a higher status to SSAP than to statutory rules when he stated:

> I have not gone through the sections in the Companies Act 1985 and the Fourth Schedule which lead to the propositions of accounting obligation which are exemplified here. There are plainly points in the interpretation of the Schedule which might give rise to difficulty. I do not believe for the present purposes and for (I hope) the useful guidance of the profession, which I have to decide, it is essential to go into those points.

Taxes Act Cases

That the statutory rules for adjusting profit to arrive at PGY override SSAP provisions where the two conflict is indisputable. In several cases however the judges appear to have relied on their exclusive right to interpret statutes as justification for denying any relevance to expert evidence of accounting principles and SSAP rules in determining PGY.

---

[10] These provisions concerned disclosure requirements for unquoted equity investments.

[11] These Sections contained rules for the preparation of group accounts.

Thus the main issue in the Wimpey case was the treatment of tipping space used for waste disposal; clearly Section 130 (f) of the Taxes Act 1970[12] prohibiting the deduction of capital expenditure was in point. This led Harman, J. to dismiss in the following terms expert accountancy evidence on the criteria for classification of fixed and current assets and on the concept of depreciation described in SSAP 12:

> [The evidence] was on the whole submissions by the accountants as to whether the expenditure was capital or income, which is of course the very question for decision by the commissioner and this court. As such, the evidence is to my mind of limited value.

Similarly in the Woolworth case Hoffmann, J. felt that accountancy evidence that exchange losses on foreign currency loans were often treated as revenue expenses 'does not seem to me to assist because Section 130 (f) Taxes Act, 1970 excludes the deduction of exchange losses on loans raised on capital account whether or not as a matter of accountancy those losses could fairly be regarded as expenditure of a revenue nature'.

Accounting rules as questions of law or fact

Companies Act Cases

There is evidence in only one of the cases, Thorn EMI, that decisions on accounting policy where there is no specific statutory rule or any such rule is overridden by the TFV requirement, are regarded by the courts as questions of law. There is no evidence that any accounting principle or rule has acquired the status of a binding legal precedent to be applied in determining TFV.

In the Thorn EMI case Harman, J. subjected the provisions of SSAP 22 relating to the writing off of goodwill on consolidation to severe criticism as follows:

> The phrase 'written off' is one which, like the word 'goodwill', is regularly used in the context, but both are in my view words which as so used are seriously misleading to the ordinary reader of accounts and even to lawyers who are accustomed to dealing with this field of the law.... It is only when one appreciates that the item described in SSAP 22 as 'goodwill' is not an item which is in any true sense written off or disposed of on consolidation that full understanding can occur.

He went on to quote with approval (at p. 701) the terminology of the Seventh Company Law Directive of the European Community:

> .... The use of the word 'goodwill' in SSAP 22 is most undesirable and unfortunate. The word is a word well known in general current use and entirely relevant to companies and their businesses.... The meaning used in SSAP 22 is something quite different. It is aptly, as Mr Curry submitted a *consolidation* difference... The consolidation difference, as it is called in the Seventh Directive, can plainly be a positive or negative difference. It is an apt and convenient description which truly does describe what one is dealing with.

Though Harman, J.'s strictures concerned terminology rather than a substantive issue of accounting practice, it is nevertheless reasonable to regard them as an attempt to provide a legal definition of an inadequate accounting rule. (Harman, J. appears to have ignored the fact that the expression 'goodwill arising on consolidation' appeared in Schedule 4, paragraph 66 of the Companies Act 1985 as originally enacted).

Taxes Act Cases

There is scant evidence in the Taxes Act cases examined to support the weight of academic opinion that issues of accounting principle in the determination of PGY are regarded by the courts as questions of law where statutory provisions are not in point. The most recent judicial statement on the matter in RTZ Oil and Gas is clearly to the contrary.

In that case Vinelott, J. cited with approval dicta of Lord Reid in the BSC Footwear case[13] and of Lord Radcliffe in Owen v. Southern Railway of Peru[14] rebutting the contention that such issues are questions of law. In the first case Lord Reid stated that in ascertaining the taxable profit of a trade 'it is well settled that the ordinary principles of commercial accounting must be used except in so far as any specific statutory provision requires otherwise'. In the second Lord Radcliffe observed that he would 'view with dismay the assertion of legal theories as to the ascertainment of true annual profits which were in conflict with current accounting practice and were not required by some special statutory provision of the Income Tax Acts'.

Conclusions

The cases bear out the expectation of Sherrard (1981) that SSAPs would have considerable persuasive value as evidence of current and proper accountancy practice. However expert evidence of accounting practice has clearly not been rendered redundant and in several cases the judges have regretted the lack of such evidence. The Dearing Committee (CCAB 1988) considered that 'the courts may not consider compliance with a particular accounting standard to be necessary if it has not yet come into general use'. While none of the decisions provides clear authority for this view, several indicate a pragmatic approach by the judges. Thus in Lloyd Cheyham, Woolf, J. observed (at p. 306) that one of the expert accountant witnesses 'underestimated the extent to which other professional practitioners could responsibly adopt different practices from that which he would adopt'. In Symons v. Weeks, Warner, J. accepted (at p. 681) the hypothetical validity of a contention that 'although the prevailing system of commercial accountancy was correct in most cases, it was not correct in a case such as this of a firm with an expanding practice'.

---

[12] Now Section 74 (f), Taxes Act 1988.

[13] BSC Footwear Ltd. v. Ridgway, H. L. (1971) 47 TC 495.

[14] Owen v. Southern Railway of Peru Ltd., H. L. (1956) 36 TC 602.

The recommendation of the Dearing Committee that the burden of proof in legal proceedings be placed on the party contending that accounts satisfy the TFV requirement despite a material departure from an accounting standard was not implemented in statute by the Companies Act 1989. Nevertheless it may be that because of the statutory recognition accorded to standards by that Act, the courts will adopt a more rigid approach in future and will apply such a rule in practice.

Not surprisingly the cases reveal a strong judicial tendency to accord primacy to the statutory rules. In the Companies Act cases there is no evidence that the statutory acknowledgment of the primacy of the TFV requirement has led the courts to attach greater weight to SSAP rules and there is certainly no instance where those rules have been permitted to override a specific statutory provision. The Taxes Act decisions suggest that concern on the part of judges to protect their exclusive right to interpret statutes may have made them over zealous on occasion in dismissing expert evidence of accounting rules where statutory provisions are in point.

There is very little evidence in the cases that non-statutory accounting rules have acquired the status of legal precedents for determining either TFV or PGY. Since only cases involving SSAPs were examined it is not appropriate to draw a definite conclusion concerning the determination of PGY. As regards the Companies Act cases, however, it is possible to confirm Tweedie's (1983) hypothesis that there is 'no reported judicial decision giving any standard the backing of the common law': accounting rules are determined as questions of fact. Nevertheless Harman, J.'s reliance on the terms of the Seventh Directive in the Thorn EMI case may be seen as supporting in some degree Lasok and Grace's (1988) contention that the meaning of TFV must now be sought within the framework of European Community law. The development of legal rules of accounting practice may therefore be inevitable.

References

Arnold, B. J. (1983), *Timing and Income Taxation* (Toronto: Canadian Tax Foundation).

Accounting Standards Committee (1983), 'Legal Opinion on "True and Fair"', *Accountancy*, November.

Ashton, R. K. (1986), 'The Argyll Foods Case. A Legal Analysis', *Accounting and Business Research*, Winter.

Burgess, R. (1972), 'Revenue Law and Accountancy Practice', *British Tax Review* (5).

Consultative Committee of Accountancy Bodies (1988), *Report of the Review Committee: The Making of Accounting Standards* (London: CCAB, 1988).

Department of Trade (1982), 'The True and Fair View and Group Accounts', *Accountancy*, February.

Freedman, J. (1987), 'Profit and Prophets—Law and Accountancy Practice on the Timing of Receipts', *British Tax Review* (2) and (3).

Instone, R. (1985), 'Realised Profits: Unrealised Consequences', *Journal of Business Law*, March.

Lasok, K. P. E. and Grace, E. (1988), 'Fair Accounting', *Journal of Business Law*, May.

Noke, C. (1989), 'Realised Profits: Unrealistic Conclusions', *Journal of Business Law*, January.

Pagan, J. (1984), 'Marine Midland—The Tip of the Iceberg for Trades in a Foreign Currency', *British Tax Review* (3).

Rutherford, B. A. (1985), 'The True and Fair View Doctrine: A Search for Explication', *Journal of Business Finance and Accounting*, Winter.

Schmitthoff, C. M. (ed.) (1987), *Palmer's Company Law* (London: Stevens, 1987).

Sherrard, M. (1981), 'Accounting Standardisation: A Lawyer's View', in R. Leach and E. Stamp (eds.), *British Accounting Standards: The First Ten Years* (Cambridge: Woodhead Faulkner).

Storrar, A. C. (1988), 'Off-Balance Sheet Financing: An Accountant's View', *Journal of Business Law*, September.

Tiley, J. (1978), *Revenue Law* (London: Butterworths).

Tweedie, D. P. (1983), 'The ASC in Chains: Whither Self-Regulation Now?', *Accountancy*, March.

Tweedie, D. P. and Kellas, J. (1987), 'Off-Balance Sheet Financing', *Accountancy*, April.

White, R. (1987), 'Profits and Prophets—An Accountant's Afterword', *British Tax Review* (8).

Appendix 1

Table of Cases

Companies Act cases

(a) Re Thorn EMI plc, Ch.D. (1988) 4 BCC 698.
SSAP 22, SSAP 23.

(b) Re Ratners Group plc, Ch.D. (1988) BCLC 685.
SSAP22.

(c) Lloyd Cheyham and Co. Ltd. v. Littlejohn and Co., Q.B.D. (1987) BCLC 303.
SSAP 2, SSAP 18.

(d) Argyll Foods Ltd. (1981) (Unreported).
SSAP 14.

(e) Prudential Assurance Co. Ltd. v. Newman Industries Ltd. and Others (No. 2), Ch.D. (1981) Ch 257, (1980) 2 All ER 841, (1980) 2 WLR 339.
SSAP 1.

Taxes Act cases

(f) Beauchamp (Inspector of Taxes) v. F. W. Woolworth plc, H. L. (1989) STC 510.
SSAP 6, SSAP 20 (ED 16).

(g) Rolfe (Inspector of Taxes) v. Wimpey Waste Management, C.A. (1989) STC 454.
SSAP 12.

(h) RTZ Oil and Gas Ltd. v. Elliss (Inspector of Taxes), Ch.D. (1987) 1 WLR 1442, (1987) STC 512.
SSAP 2

(i) Symons (Inspector of Taxes) v. Weeks and Others, Ch.D. (1983) STC 195, 56 TC 130.
SSAP 9, SSAP 17.

(j) Pattison (Inspector of Taxes) v. Marine Midland Ltd., H.L. (1983) STC 10, (1982) Ch 145, (1981) 3 WLR 673, 57 TC 219.
SSAP 20 (ED 21).

(k) Pearce (Inspector of Taxes) v. Woodall-Duckham Ltd., C.A. (1978) STC 372, 51 TC 271.
SSAP 9 (ED 6), SSAP 6.

(l) Emmerson (Inspector of Taxes) v. Computer Time International Ltd. (in liquidation), C.A. (1977) 2 All ER 545, (1977) 1 WLR 734, 50 TC 628.
SSAP 2.

Counter Inflation Order case

(m) Associated Portland Cement Manufacturers Ltd. v. Price Commission, C.A. (1975) ICR 27.
SSAP 2, SSAP 7.

APPENDIX 2

Frequencies of citation of Standards

Accounting Standard	*Frequency of citation*
SSAP 1 (Associated companies)	1
SSAP 2 (Accounting policies)	4
SSAP 6 (Extraordinary items and prior year adjustments)	2
SSAP 7 (Current purchasing power accounting)	1
SSAP 9 (Stocks and work in progress)	2
SSAP 12 (Depreciation)	1
SSAP 14 (Group accounts)	1
SSAP 17 (Post balance sheet events)	1
SSAP 18 (Contingencies)	1
SSAP 20 (Foreign currency translation)	2
SSAP 22 (Goodwill)	2
SSAP 23 (Acquisitions and mergers)	1

Accounting and Business Research, Vol. 20, No. 80, pp. 337–351, 1990

Origins of the Plan Comptable Général: A Study in Cultural Intrusion and Reaction

Peter E. M. Standish*

Abstract—This study examines the origins of the present-day French *Plan comptable général*, the first national accounting code in the world to be adopted under normal peacetime conditions. Its origins occurred during the Second World War when the Vichy Government appointed a commission to develop and implement a national accounting code. The intention was that the code be made obligatory for all enterprises and the commission would advise on adaptations of the code to meet the needs of particular industries. The original inspiration for the wartime project was the Goering Plan, the pre-war German national accounting code adopted in 1937 by the Nazi Government. Until now, the circumstances of the wartime French project have been largely unknown or forgotten due to the dispersal or disappearance of relevant official archives and other contemporary source documents. The object of this study is to throw light on why the Vichy Government undertook the project, and how it proceeded. From examination of records of the commission and other documents of the period, it is possible to make judgements about the relative influence of the German Occupation authorities and indigenous French priorities on the development of the Plan.

Introduction

The objective of this article is to explain and interpret the circumstances leading to the foundation of a national accounting code, the *Plan comptable général*, in France during World War II. The significance of the *Plan* as a social arrangement for the organisation and control of accounting is that France became the first nation to retain and actively develop a national accounting code under normal peacetime conditions. The Plan has since evolved to the point where it is deeply embedded in French accounting practice and financial administration. It can be regarded as a form of social software, through which all manner of financial functions are programmed. The example of the French code has been significant internationally, especially within the European Community as a model for other member states that have instituted national accounting codes (Spain, Belgium, Greece). As well, it has influenced a number of African states having colonial or cultural links with France and which have instituted codes or are in the process of doing so.

Historic Context

The first nation to institute a national accounting code was Nazi Germany in the years immediately prior to World War II. The idea of a standardised accounting code had been advanced in Germany prior to the Nazi regime by the much respected German accounting professor, Eugen Schmalenbach, but without a response in the political domain. It appealed, however, to the Nazi Government as a convenient national instrument of control over an economy being moved rapidly on to a war footing (Forrester, 1977) and was approved in 1937 by Reichskommissar Hermann Goering as the regulations for bookkeeping principles, *Grundsätze für Buchhaltungsrichtlinien*, known henceforth as the Goering Plan. The Government then set about using the structure of commerce and industry chambers to adapt the basic standardised chart of accounts to the needs of each branch of economic activity and to apply the concept of a standardised chart of accounts throughout the economy (Singer, 1943).

Following the fall of France, the Vichy Government was faced with two imperatives: to meet German demands for French economic resources and, from its own viewpoint, to find ways to preserve possibilities for an autonomous French economy and society. It put in train a project for developing a national accounting code and, having established a structure of industry committees for the purpose of meshing industrial and commercial activity with the requirements of the Occupation, sought to use that same structure as a basis for adapting the national accounting code to each

---

*Particular thanks are due to Mme C. de Tourtier-Bonazzi, Conservateur en Chef de la Section contemporaine, Direction des Archives de France, for arranging an interview with M. François Lehideux, former Minister of the Vichy Government; to Mme M. Digoud, Service des Archives économiques et financières, Ministère de l'Economie et des Finances, for locating an invaluable collection of war-time archives and the *Plan comptable général* as published in 1943; and above all to Mme C. Servouse, Bibliothécaire, Ordre des Experts Comptables et des Comptables Agréés, for assistance without stint in locating and photocopying archives and documents of the period.

industry sector. The national code, the *Plan comptable général*, was substantively completed in 1941, presented to the Government in 1942 and published in 1943. Before measures could be taken to apply it throughout industry, however, the authority of the Vichy Government had been swept aside and conditions no longer existed for the orderly introduction of this or any other major social change.

The Explanatory Task

To reveal the bare bones of this context explains little. There was nothing inevitable about the implantation of a national accounting code in France during the war or its retention afterwards. It is not known whether the Germans tried seriously to introduce the concept of a national accounting code into other occupied countries during the war. Certainly no other country instituted one.[1] West Germany after the war did not preserve the 1937 Goering Plan by legislative means and has not done so to this day (although the idea of industry accounting codes is said to be prevalent in German accounting practice). Other Western nations which moved post-war, as did France, in the direction of a larger role for the state in economic affairs (e.g. through nationalisation, as in Britian) did not at that early stage take up the idea of a code.

To carry out a proper analysis of the origins of the *Plan comptable général* requires attention to the interplay of factors and values in the social context of accounting. In addition, allowance must be made for the chance involvement and contribution of the individual. The task is not rendered easier by the fact that accounting has little by way of socially grounded history. Rather, its writers and commentators have found it more interesting to stick closely to the specifics of the accounting theories and practices than to venture into deeper waters of social analysis.

As a contextual factor, the turbulence of the war-time period in France produced major discontinuity in the structures of French governance and retention of records. It also generated memories that still touch on raw nerves (Rousso, 1987). Nevertheless, it is instructive to compare the present field of enquiry with that of the establishment of national economic planning in France. Prior to this paper, there has been no reported study dealing with national and other specialist archives relating to the war-time development of the *Plan comptable général*. Moreover, the meagre French accounts of the origins of the *Plan* and the few brief references to the subject in English, either from the period of its conception or subsequently, deal with its history and circumstances almost without reference to the principal actors in the story. The field of accounting, as an area fit for scholarly attention or as one of interest to *le haut monde* of politics, bureaucracy and policy making, has had a low profile in France, without the comparable attention devoted to *planification*. It seems that we are looking at two sets of personages—the high technocrats of economic planning and the would-be standardisers of financial accounting. The former would certainly have been known in some degree to the latter but the technocrats appear to have taken little cognisance of the accountants. In this regard, Fourquet (1980) is instructive. This singular work records a series of interviews with or recollections of the post-war planners. It is replete with references to institutions concerned with economic affairs and national accounting but neither the 1942 Plan nor the 1947 Plan and their related institutions rate a word. The index does not refer to a single known accountant.[2]

Research on the origins of the *Plan comptable général* has uncovered a more diversified French accounting literature from the 1940s and early 1950s bearing on the subject of a national accounting code than had been expected, given the narrow concentration of contemporary French financial accounting literature on the present-day *Plan*. The early literature has to all intents and purposes been forgotten or mislaid by the French themselves.[3] Its value resides in the wide-ranging way in which it addresses policy issues concerning standardisation and regulation of financial accounting and reporting, having regard to the interplay of social and political forces. Thus the conduct of the research has on the one hand been easier, given the wealth of ideas and proposals advanced at the time (primarily from the post-war period), and more difficult, due to gaps in the source records so far located.

Two planes of analysis can be envisaged, one to examine the *Plan* in its social context and the other to address the acounting theories and practices embedded in the *Plan*. Here, attention is given to the former since detailed consideration of the choices made for adoption or rejection of technical accounting bases and procedures merits attention in its own right. The period chosen for analysis is that of the war, with some reference to antecedent events and ideas, and a brief epilogue pointing to the post-war period and the new *Plan* of 1947. By that time, the *Plan* has been recreated and an institutional infrastructure established, both of which have continued to this day, albeit with much subsequent modification and expansion.

---

[1] Mommen (1957, p. 47) refers to the occupied countries as becoming acquainted with projects for accounting standardisation, but gives no details.

[2] Two economists who made significant contributions to the literature of the 1940s dealing with the *Plan*, Fourastié and Lutfalla, rate brief mention on three pages and one page, respectively, but only in relation to their activities as economists.

[3] I have personally rescued a number of important works of the period from almost certain destruction or ruin, given the poor quality of paper available for printing at the time and the extreme fragility of many early surviving records. The library of the *Ordre des experts comptables et des comptables agréés* has in consequence begun an active programme of document copying and conservation.

Originating events and social influences on the *Plan*

Using Hindsight to Trace Pre-war Influences on Accounting Standardisation

This section is concerned with the origins of the concept of a national accounting code, as related to the circumstances of its adoption in France and as seen by writers of the period. Those origins are identified in indigenous French ideas on financial accounting and through foreign influences, notably German experience with the Goering Plan. In this context, there are two principal explanations found in the literature of the time for acceptance of a national accounting code:

(1) French writers and thinkers on accounting had increasingly come to favour the idea, whether as a result of foreign influence or simply as a process of indigenous development of views on what was required for the satisfactory social organisation of accounting.
(2) Government was moving to implement the idea when war intervened.

French literature on the *Plan* is somewhat divided between those who drew attention to the Goering Plan as an example of a functioning code and those who wished rather to push it into the background, whilst emphasising pre-war French ideas and experience with accounting standardisation. Three persons of importance in the development and diffusion of the 1942 *Plan comptable général* all refer to the Goering Plan, without throwing direct light on the circumstance of the Occupation as a possible factor in the move to adopt a national accounting code modelled on the German code (Detoeuf, 1941, p. 9; Chezleprêtre, 1943, p. 14; and Fourastié, 1943, p. 14). Some post-war writers dealt more frankly with the issue of German influence, eg. Lutfalla (1950, p. 79) who evidently saw the 1942 *Plan* as thoroughly German in conception and design.[4] Mommen (1957, p. 47) saw the 1942 *Plan* as slavishly imitative of the Goering Plan.[5] Lauzel, (1959, p. 71), whilst acknowledging points of similarity with the Goering Plan, argued that the 1942 *Plan* incorporated important elements from French developments before the war[6] but cited one example only, namely the pre-war ideas on uniform determination of cost of sales published by the *Commission générale d'organisation scientifique* (or CEGOS,[7] as it was widely known; Commission générale d'organisation scientifique, 1937). With a different twist, Fourastié (1943, p. 84) accepted that the *Plan* benefited from the precepts of the Goering Plan.[8]

Others argue a line of descent from indigenous French ideas about financial accounting. At one level, this is inevitable. The nomenclature for financial accounting items and widespread professional familiarity with basic accounting techniques would have combined to ensure a code having many points of familiarity with pre-war practice, as noted in Retail (1951, p. 1).[9] Indigenous ideas on accounting standardisation have been traced back as far as 1880. Lauzel (1955, pp. 90–91) refers to the first French Accounting Congress of that year, held under the patronage of the *Comité Central des Chambres Syndicales Patronales* and the *Union Nationale du Commerce et de l'Industrie*, on the subject of unification of accounting (*Unification de la Comptabilité*). From the viewpoint of the later development of the *Plan comptable général*, the following circumstances of the Congress are noteworthy:

(1) The holding of the Congress under the aegis of two bodies representing employers and the chambers of commerce and industry reflects the fact that there was at the time no national body to speak for accountants.[10]

---

[4] Referring to the replacement of the 1942 Plan by the 1947 Plan, Lutfalla remarks: 'Le cadre allemand a été repensé et naturalisé'.

[5] '. . . ce plan 1942 n'est qu'une adaptation fort servile du plan Goering'.

[6] 'Du point de vue technique, il est vrai que ce plan [of 1942] présentait des analogies avec les principales parties de l'instruction allemande de novembre 1937. Mais, en sens contraire, il a été établi que la dite instruction avait fait des emprunts importants à certains travaux français d'avant-guerre . . .'.

[7] The CEGOS 1937 report summarises its activities dating back to 1928 in its search for standardisation of accounting for cost of sales. The report acknowledges, pp. 3–4, that these were inspired by Lieutenant-Colonel Rimailho, 'apôtre de l'organisation rationnelle'. I have been told that Rimailho was an army engineer who had developed ideas relevant to problems of cost control for purposes of defence production. He has even been described to me as the true father of the *Plan comptable général* though, as his name appears nowhere in the records of its formative years during World War II, this claim appears rather fanciful.

[8] '. . . le plan comptable français . . . a bénéficié des enseignements du plan allemand; il présente donc de notables perfectionnements techniques'.

[9] 'Aussi bien, et depuis longtemps, un très grand nombre d'usages se sont-ils généralisés. Les comptabilités des sociétés sérieuses se ressemblent de plus en plus pour tout ce qui concerne l'essentiel. On peut dire qu'un bilan type a été imposé par la pratique'.

[10] Nor was there a statutory procedure at that time for registration of accountants or auditors.

(2) Without seeing records pertaining to the Congress, it is not possible to know what was implied by its title, what its substantive concerns were or why the two bodies went to the trouble of organising it. But it does point to an early interest by employers (the *patronat*) in questions relating to accounting. This was to become important much later, in the Vichy period and especially post-war.

Retail (1951, p. 1) refers to the foundation in 1881 of the *Société de Comptabilité de France* and to the spread of cognisance of proper accounting principles through teaching at the *Ecole des hautes études commerciales*, as well as other (unnamed) schools of higher commercial studies. The *Société* continues to exist, though as an interest group and not as a professional institution. The *Ecole* itself, founded in 1881 by what is now the *Chambre de commerce et d'industrie de Paris* (Weisz, 1983, pp. 112–113), provided a further sign of a long-standing general interest by important sections of the business community in advancing an awareness of accounting. From 1880 to World War II, a number of French writers contributed to the financial accounting literature with ideas that variously underpin possibilities for standardisation in accounting (Reymondin, 1909; Mommen, 1957, ch. 1; Mommen, 1958, index references; Lauzel, 1959, pp. 62–63). In summary, the perceived possibilities rested on:

(1) accounting principles claimed to be primordial and universal bases for financial measurement and reporting;
(2) ideas similarly advanced as universal bases for the construction of charts of accounts and associated recording of accounting transactions;
(3) model formats for balance sheets and income statements.

Pre-war literature on standardisation dealt little with issues of financial measurement (other than the question of determination of cost of sales) but concentrated on design of charts of accounts and on standardised formats for annual accounts. By degrees, ideas for accounting standardisation came to be seen as applicable in ever wider contexts. In the inter-war period various writers and speakers at international accounting congresses advocated international standardisation or uniformity and examples of standardised charts of accounts were promoted in the countries of their authors, eg. Faure in France, Blairon in Belgium and Schmalenbach in Germany (Mommen, 1957, ch. 1). Although their texts have not been examined, it appears (and no statement to the contrary has been sighted in any of the sources quoted) that none of these authors or others cited in Mommen advocated establishment by government of a national accounting code. Neither these contributions nor the advocacy of CEGOS on the more limited issue of standardised accounting for cost of sales had any widespread practical effect prior to the German Government adoption of its national accounting code inspired by the work of Schmalenbach.

Support for the second line of French parentage for a national accounting code, namely government support for accounting standardisation, is advanced by reference to examples of regulatory imposition of a standard chart of accounts and model annual accounts. Prior to the advent of the *Plan comptable général*, the *Code de commerce*, as the relevant basic law dealing with French commercial and company law, contained no general prescriptions for the arrangement of the annual accounts nor for the organisation of the accounting system on the basis of a model chart of accounts.[11] There were, however, three important pre-war exceptions (Lutfalla, 1950, pp. 72–76), namely the accounting and reporting requirements relating to insurance companies (1939), banks (1935 and 1941) and contractors for defence and war materials (various decrees and laws, 1938 and 1939). Banking and insurance, however, have been regarded in many nations at different times as industries requiring special regulation in relation to the keeping of accounts, compliance with prudential and valuation constraints, and presentation of annual accounts. Defence contractors have also often found themselves subject to governmental attempts at profit regulation. In none of these examples could French experience be regarded as unusual. None of them, therefore, provides convincing support for an argument that might imply a consequent likelihood of a national accounting code.

In summary, there was nothing in the conventions of pre-war French financial accounting practice or in the requirements of the *Code de commerce* that presaged implementation of a national accounting code under normal peacetime conditions. There is a near universal theme amongst French writers during and after the war that the state of pre-war French accounting was unsatisfactory, even parlous, but that for want of appropriate laws and institutional arrangements, advance in any direction was unlikely. There were many strands in practice, in ideas about financial accounting and in the limited initiatives to strengthen financial reporting regulation to provide a base on which to develop a code, but none of them appeared likely to produce much effect without the catalytic impact of the war and its consequences for France.

---

[11] See Culmann (1980, ch. 1) for a summary of the actual requirements.

German Occupation and the Vichy Government

In this section the focus shifts to a consideration of whether the Germans were principally responsible during the war for provoking development of a national accounting code in France or whether it was the Vichy Government. There are two principal competing explanations for what happened:

(1) The Germans, to suit their own aims for France following its defeat, directed the French to institute a code based on the Goering Plan but left the French civil administration to work out the details and their application, provided the result conformed with overall German policy.

(2) Alternatively, having become aware of the Goering Plan but without any particular prompting from the Germans, the French judged that a similar code would suit their national aims and instituted it primarily for their own ends.

To try to identify the more likely explanation requires that regard be paid to the relative priorities of the two sides, German and French, and the distribution of effective authority between them in the relevant area of social process. The broad structure of French governance from June 1940 to August 1944 may be briefly summarised in the following terms (abstracted from Paxton, 1972; Michel, 1986). France effectively withdrew from the war by signing an armistice with Germany effective 25 June 1940. France was territorially dismembered into two principal zones, the Occupied Zone comprising the northern half of the country and its western seaboard, including Paris and the majority of the French population, and the Non-occupied Zone, nominally consituting a free nation and over which ran the writ of the French Government, then installed in Vichy.[12] The Germans subsequently occupied the Free Zone on 11 November 1942, though the structure of the Vichy Government continued until it crumbled in the face of Allied advances across France in August 1944. In practice, the Germans did not want the burden of civil administration of France and a wide range of civil functions continued to be carried out by the normal structures of French administration in both zones throughout the whole period of the Occupation.[13]

In matters judged important for the war effort, the Germans showed little or no respect for the terms of the armistice or integrity of the Vichy Government and requisitioned materials and supplies, dealt directly with French enterprises capable of supplying industrial products and demanded a supply of labour to work in German industry. An enormous indemnity was laid upon France, initially set at 400 million francs per day and finally totalling 632 billion francs by the time of its cessation on 3 September 1944, amounting to 58% of French Government income in the period 1940–1944 (Paxton, 1972, p. 144), payable at an exchange rate blatantly favourable to the Germans. It was repeatedly made clear to the French that the Germans did not really care what the French had to do to comply with German demands or what deprivations and financial pressures might be engendered. For example, the Germans set quotas for food delivery to Germany but left details of the inevitable systems of rationing and price control to the French.[14] Although the Vichy Government was at all times based as a political entity in Vichy, together with many of its high functionaries, Paris remained the base for much French administration, including departments and authorities concerned with economic affairs, financial controls and tax administration.[15] The work of the commission charged with developing the national accounting code was carried out in Paris. The headquarters of the German Occupation, at the Hotel Majestic, were also in Paris.

The question of what actions the German Occupation may have taken to direct the establishment of a national accounting code is complicated by the fragmentary nature of surviving records, given that many of the official records emanating from the Occupation authorities were either destroyed or have, in any event, disappeared. Fortunately, a quantity of relevant official archives and other wartime records, referred to subsequently as the AEF documents, have recently been located.[16] By reference to AEF documents and other sources, some indication of the attitudes and actions of the German Occupation may be gleaned:

(1) Villard (1947, pp. 95–96) states that in November 1940 a French translated copy of

---

[12] Though not stipulated by the armistice, Alsace-Lorraine was reannexed by Germany and the Départements of Nord and Pas-de-Calais were attached to the German military administration of Belgium.

[13] By Article 3 of the armistice, the French Government was bound to assist the German authorities in exercising the 'rights of an occupying power' in the Occupied Zone (Paxton, 1972, p. 19).

[14] Milward, 1970, pp. 68–69, gives some indication of the steps by which rationing was put into effect.

[15] Cathala, Minister of Finance and National Economy, 1942–1944, in describing the discharge of his responsibilities, refers to work carried out by 'the entire general staff and all the services of the rue de Rivoli', traditional location of his Ministry (Cathala, 1958, p. 90).

[16] The material was located by me earlier in 1989 in the *Archives Economiques et Financières* (here referred to as AEF), *Ministère de l'Economie, des Finances et du Budget*, rue de Rivoli, Paris. The archives included a quantity of memoranda, minutes and other assorted documents, as well as a genuine rarity, the 1942 *Plan comptable général* published in 1943 by Editions Delmas, of which no copy exists in the libraries of the *Ordre des experts comptables et des comptables agréés* or the *Conseil national de la comptabilité*.

a memorandum of 15 pages from Goering, originally circulated in technical circles in Germany, was similarly circulated in France. Entitled *Circulaire du maréchal Goering concernant la tenue des livres comptables*, the memorandum was stated to be for the use of public accountants when advising clients. After traversing objectives for accounting, it deals with the matter of the establishment of an accounting code for manufacturing enterprises.[17]

(2) A confidential AEF document, signed by the Secretary General, *Commission du Plan Comptable*, 23 March 1942, addressed to the *Ministère de l'Economie et des Finances*, indicates that, the Commission having completed its task of developing the *Plan comptable général*, the Secretary General can add further discreet commentary on its work and outcomes. Included in the document is the reproduced text of a two-page memorandum of 20 October 1941 from the Head, German Military Administration in France, Dr Michel (presumably the *Militärbefehlshaber in Frankreich*),[18] which is highly indicative of German policy and objectives. The addressee of the memorandum is not stated nor whether there was a wider distribution list to whom it was circulated. Its principal observations and demands may be summarised as follows:

(a) The official work of price control has been extraordinarily complicated by the huge variety of ways employed in enterprises for arriving at production cost;
(b) To deal with this, uniform accounting rules are needed for each sector of activity, to be published before the next accounting period and to cover the whole industrial sector;
(c) The commission of the French Government then working to develop a code is requested to transmit its view of the appropriate accounting principles by 15 November [1941];
(d) Following their receipt, the accounting principles in force in Germany will be brought to the attention of the Commission, which will then be expected to establish a comparison with its own proposals.

Thus there is evidence of German pressure for the development of a national accounting code. To command, however, is not the same as to be obeyed. Nor does a command constitute a policy or framework for execution of what would be, as in this case, a matter with many complications. Standardisation of accounting principles alone does not constitute a standardised accounting code. Moreover, the circular is dated some seven months after the Vichy Government had announced the formation of its commission to draw up a national accounting code. Thus we do not know whether the German circular was in essence reinforcing a French initiative or whether it was repeating an earlier German direction to the Vichy Government. No later indications have been found of direct German interest in the development of the *Plan comptable général*[19] nor, once the *Plan* had been drafted and circulated, in prodding the French to follow any particular timetable of procedures for its implementation.

By inference, it is not clear on what grounds an active concern with establishment of a national accounting code would have been worth the effort in terms of German war aims. This could only have made sense if there were some evident way in which a code could have simplified the task of extracting economic resources from the French, such as forcing measurement of production cost on to some Procrustean bed of standardisation, or reconstructing the basis for business taxation to mesh in with the code (as happened much later, after adoption of the 1957 *Plan*). Instead, to have become directly involved in the project for a code, the Germans would presumably have been obliged to bring in their own accounting personnel to supervise and work effectively with the French, with all the usual differences of technical language and likely hostility to their presence. But why go through that long arduous toil when a detachment of armed troops could directly commandeer goods, or, at a more sophisticated level, inducements could be offered for companies to develop defence production factories with special access to resources (Gaillochet, 1958)?[20] Essentially, the Germans had neither the need nor the time to do any more than draw the attention of the French to the Goering Plan and commend it as a model.

---

[17] The AEF documents include what is presumably a copy of this memorandum, though the AEF document runs to 18 pages plus a large fold-out sheet setting out the standardised accounting code of the Goering Plan. It is contained within a sleeve bearing a date in 1941 and a handwritten note, difficult to decipher, from a Sub-Director to a Director.

[18] See references in Milward, 1970, to the structure of the German military administration and especially to its *Wirtschaftsabteilung* (Economic Affairs Division).

[19] For example, the minutes of the *Commission du plan comptable* make no reference to the Goering Plan or to German views and requirements, nor was any representative of the Occupation authorities ever recorded as present at its meetings.

[20] These points are strikingly illustrated in incidents recorded in Cathala (1958). Cathala recounts that, in December 1942, he refused to accept appointment by the German Government of its own financial counsellor to his ministry, on the grounds that it had no right to interfere with French administration (pp. 109–110). By contrast, on 11 August 1944, presumably when the Allied advance had almost reached the gates of Paris, a refusal by the *Banque de France* to hand over an occupation indemnity of 8 billion francs provoked the arrival of an armed and motorised German detachment which obtained the money (pp. 87–88).

The second explanation, that of an autonomous initiative by the Vichy Government, demands consideration of possible reasons. As Paxton (1972) and Michel (1986) show, Vichy was the focus and battleground of contending explanations for the defeat of France, of questions about what France would do next, and of ideas about how it should seek its way in the world ahead, whether in a German-dominated Europe, or following an eventual Allied victory. Perhaps the one theme on which there was unanimity was a conviction that France had drifted hopelessly under the shifting parliamentary factions and practices of the Third Republic, which seemed designed for vacillation and disregard of expertise in economic affairs (see also Zeldin, 1979, ch. 6 et seq.). Initially, Pétain and his regime were identified with a resurgence of conservatism, Catholic social values, a rather dreamy conception of the peasantry and the supposedly uplifting moral values of rural life, and a corporatist social organisation in which there would be a web of self-governing intermediary organisations between the individual and the state (on this latter, see Elbow, 1953, chs. V and VI; Ehrmann, 1957, index references; and Kuisel, 1981, pp. 144–146). What materialised, however, was quite different, summarised by Paxton, 1972, p. 350, in these terms:

> . . . the evolution we have seen at Vichy, away from traditionalist values toward administration by experts and planned modernisation, conformed with the longer-term trend in French politics and society.

Both Paxton (1972, pp. 259–268) and Ehrmann 1957, ch. II) examine the rise and influence of experts in a situation where there were no longer any incommoding parliamentary procedures and where the expert might well, and frequently did, become a minister. Particularly significant was the interaction between industrialists, often engineers trained at the prestigious *Ecole des Mines* or the *Ecole Polytechnique*, and inspectors of finance graduated from the celebrated *Ecole des Sciences Politiques*. What they widely shared was a deep rooted conviction that France had somehow to modernise and restructure its industry if the nation were to survive the insatiable demands of the Germans,[21] let alone the constant threat of war damage.

In this context, moves were made by the Vichy Government to institute economic planning (which may be regarded as creating an ideological foundation for national econonic planning after the war). Prominent in this activity and an example of the technocrat turned functionary-minister was François Lehideux, formerly a director of the Renault motor vehicle company, and holder of various senior positions in the Government. At one stage, as Delegate-General for National Equipment, he produced a ten-year plan for national investment in productive plant which in spirit was a forerunner of aspects of the post-war Monnet Plan (Lehideux, 1958; Kuisel, 1981, pp. 146–156). Lehideux was definitely aware of the project for a national accounting code, being Minister for Industrial Production and signatory to the Decree of 19 November 1941 which varied the composition of the commission for the *Plan*.[22]

A key link in economic relationships with the Germans, in the working out of ideas about the future of the French economy and its industrial strength, in asserting control over the economy as against direct German control, and in providing a framework for detailed economic planning, was to be played by the *Comités d'Organisation* (Milward, 1970, see index). Established by a law of 16 August 1940, they were to stand in authority over each branch of industry and commerce. By Article 2, the *Comité* was to undertake the following functions (Ehrmann, 1957, pp. 77–78):

(1) inventories of production facilities, available raw materials and manpower;
(2) establishment of manufacturing programs;
(3) organisation of the purchase and distribution of raw materials;
(4) development and standards for production, quality and competition;
(5) price fixing;
(6) overall measures for the better functioning of the industry in the common interest of enterprises and their employers.

As a class of institutions, the *Comités* were at the same time authoritarian in imposing the will of the state and corporatist in throwing weight upon their constituency to achieve a degree of self-government and self-regulation. The manner in which the

---

[21] Documents and depositions reproduced in the Hoover Institution (1958) pertaining to the Vichy Government bring home tellingly the incessant tug-of-war between the Germans and the French ministers and bureaucrats; of relevance here, see ch. I, Industry, and ch. II, Finance.

[22] Lehideux was one of the key persons in a television studio programme, *Droit de réponse*, which I saw when screened in January 1986. The studio panel also included the American historian, Paxton, cited in this article. As an occasion which revealed some of the intense emotions still surrounding the Vichy period, it was electrifying viewing. Though 40 years on from the period, Lehideux was unshaken in his convictions that much of what was done was for the longer term benefit of France.

M. Lehideux was kind enough to grant me an interview in April 1989. It ran for over two hours and was tape recorded. Again and again, he returned to the theme of French economic backwardness at the outbreak of the war and of the determination of himself and other like-minded persons to reform its institutional structures. He is not an accountant and had no close recollection of the matter of the *Plan comptable général* or its outcome.

Comités operated is explained in Ehrmann (1957, pp. 76–90). He notes (p. 87) that there were 91 in operation in the spring of 1941 and 234 three years later.[23]

The pull of conflicting necessities on the Vichy Government in regard to the *Plan* is clearly reflected in the AEF document of 23 March 1942, referred to previously. In introducing the October memorandum from the German Head of the Military Administration, the Secretary General stated that one could acknowledge or regret the need to have recourse to a national accounting code but that in any event the Germans had now intervened in the debate.[24] Following the text of the German memorandum, he went on to report, though without furnishing specific details, that the Military Administration had, since that October memorandum, foreshadowed a system for price approval applications that would necessitate fine-tuning of accounting systems, and that it had begun to despatch German experts to verify enterprise accounting. The Secretary General posed what he evidently regarded as the crucial choice for Government and business enterprises, in these terms:

(1) In resisting a French national accounting code, would enterprises find themselves saddled with one of German inspiration and its disadvantages, particularly in regard to its use for price control, without the Government being able derive some advantages.

(2) On the other hand, if the Government were rapidly to adopt a national accounting code generally in line with German precepts, would it not gain time and thereby evade new measures for German control.

From this evidence it is inferred that the Vichy Government had the motivation to establish a national accounting code. Its motivation reflected the perceptions of a dominant combination of bureaucrats and technocrats, eager to modernise the economy, to obtain more reliable and systematic financial information on business performance and to integrate that information more firmly in line with overall government policy for economic planning and direction. The direct model for a functioning national accounting code was indisputably the Goering Plan, but the birth of the *Plan comptable général* in France was seen as an idea in the service of the French nation. Moreover, the Vichy Government could take a longer view of the domestic advantages of a code than was possible for the Germans. At the same time, it understood that realisation of a code would take much time and effort (Ordre National des Experts Comptables et des Comptables Agréés, 1943, address by Minister Cathala, p. 17).[25]

The project for a national accounting code

This section is concerned with the means by which the *Plan comptable général* was developed. Experience of accounting standard setting and accounting harmonisation in the past 20 or so years demonstrates the difficulty of achieving significant changes in accounting practice and reducing the freedom of choice available to those responsible for preparing and presenting accounts. At the time when the Vichy Government set about the task of implementing a national accounting code, there was little to draw on in the way of examples of accounting standardisation elsewhere, other than the processes used in Germany to achieve the fairly rapid adoption and application of the Goering Plan (Singer, 1943).

Drawing on general theories and observed instances of major social change, it might be anticipated that there were two principal alternative explanations for the manner in which the Plan was developed:

(1) The process was essentially a dictatorial one, in which the government sought to impose a code regardless of the wishes of those to be affected;

(2) The process was in significant respects a consultative one, in which a substantial effort was made to consult with those to be affected and to take account of their wishes.

The point of posing these alternative explanations is to throw light on the extent to which the notion of the Plan was culturally embedded or imposed from without. If the process was highly dictatorial, its hold would be fragile in open peacetime conditions. That is to say, French war-time experience with the development of a national accounting code would suggest that the code was unlikely to have been instituted under peacetime conditions in which it is easier for competing interest groups to mobilise their support or opposition. On the other hand, if the process was largely one which locked in negotiated commitments, the experience would have implications for a peacetime society, as a model for how a national accounting code might be developed and instituted.

---

[23] Paxton (1972, p.194) refers to there being 321 *Comités* (no date cited). The explanation for this difference is not known.

[24] 'On peut, chacun selon ses sentiments personnels, ou admettre ou regretter la nécessité de recourir à des mesures comme celle de l'institution d'un Plan comptable général. Mais il faut penser que, du fait des événements actuels, l'Allemagne intervient dans le débat'.

[25] 'Je crois... qu'une bonne comptabilité générale constituera un énorme progrès pour l'ensemble de l'économie française, mais je crois aussi que l'établissement d'une bonne comptabilité est une oeuvre de longue haleine qui doit être accomplie, dans les conditions où nous sommes, avec infiniment de prudence; ce qui n'empêche pas, dès maintenant, d'y travailler et de la préparer'.

The question of the degree of direction or participation in the project is one to be tested in light of evidence in official records, contemporary commentary and personal recollections. The first official indication of a project for a national accounting code came with the Decree of 22 April 1941 (*Journal Officiel* of 3 May 1941), which instituted the *Commission du plan comptable*,[26] to the following effect (summarised and interpreted from the text of the Decree):

Article 1: Tasks

(1) to elaborate a general accounting framework which could at a later stage be made compulsory for all enterprises;

(2) to provide its opinion on proposals for detailed accounting codes established in each specialised trade by the relevant organising committee.

Article 2: Membership

The membership of 32 persons specified in 14 separate categories may be classified as follows in terms of the relationship of its members to the State:

Public sector	17
Private sector	10
Autonomous associations and centres for enquiry	5
	32

Article 3: Process

Each detailed accounting code established by a trade or industry organising committee was to be drawn up at the same time by a *rapporteur* selected by the committee and a professional accountant designated by the President of the *Commission* from a list established by the Ministry of the national economy and finance.

Article 4: Implementation

The Ministers of the national economy and finance, agriculture, justice, industrial production and national education were charged with carrying out the Decree.

In addition to the Decree and the AEF documents, there are published or circulated secondary sources wholly or partly devoted to the *Plan* and the circumstances of its development, ranging from conference presentations to books.[27] Examination of the AEF documents relating to the work of the *Commission du plan comptable* points strongly to the role of three key persons (Chezleprêtre, Detoeuf and Caujolle) in giving the whole project a sense of urgency, in securing political commitment and in achieving professional acceptance.

Technical Expertise and Task Definition

The role of providing the *Commission* with what it accepted as requisite technical expertise and of defining its task was performed by Jacques Chezleprêtre,[28] Secretary-General of the *Commission du plan comptable* throughout its deliberations. At the commencement of the project he was a senior civil servant within the *Ministère de l'économie nationale et des finances*.[29] Chezleprêtre had already taken the high ground in the matter of a national accounting code with a substantial report presented by him in December 1940 to the *Commission de la normalisation des comptabilités*.[30] Its four chapters address the following:

---

[26] Also termed in the Decree, the *Commission interministérielle du plan comptable*.

[27] Those located and consulted are:

(i) War-time period

Detoeuf (1941), Caujolle (1942), Comité d'Organisation du Bâtiment et des Travaux Publics (1942), Chezleprêtre (1940), Chezleprêtre (1943), Commission Interministérielle (1943), Péricaud and Calandreau (1943), Fourastié (1943) and Viandier (1942).

(ii) Post-war period

Brunet, C. (1945), Fourastié (1945), Brunet, A. (1947), Brunet, C. (1948), Horace (1948), Caujolle (1949), Cauvin (1949), Lamson (1950), Lutfalla (1950), Brunet A. (1951), Retail (1951), Lauzel (1955), Lauzel (1959) and Villard (1947).

[28] Invariably cited only as J. Chezleprêtre in the war-time texts, his given name, Jacques, is shown in Cordoliani (1947, bibliography).

[29] Chezleprêtre is inferred to have been appointed to the *Commission du plan comptable* as representative of the *Directeur de l'economie générale, Ministère de l'Economie nationale et des Finances*, the latter or his representative being named in the constituting Decree to be a member of the *Commission.*

From personal enquiry I have been told that Chezleprêtre was a statistician by training. His official position at 29 May 1941, the first meeting of the *Commission* for which the minutes have been sighted, was *Directeur des Contributions directes.* Evidently his position was redesignated at about the same time. In the following minutes of 19 June 1941, he is recorded as *Directeur des Enquêtes régionales et de la Documentation économique (Finances)* and is so recorded thereafter. His various memoranda to the *Directeur général* of his ministry, commencing with that of 7 November 1941, also use this latter title. Both positions evidently came under the *Administration des Contributions directes*, a division within the ministry. The various secondary works during the war that refer to Chezleprêtre or which contains prefaces written by him use the latter title.

[30] No documentation has been located to throw light on the constitution, task or operation of this *Commission.* Was its creation a response to the November 1940 circulation of the Goering memorandum referred to above? It is assumed that the Commission was subsumed by the establishment of the *Commission du plan comptable*, April 1941. Ironically, the first official moves after the war to institute a *Plan comptable général* were by appointment of a *Commission de Normalisation des comptabilités*.

(1) the need for accounting standardisation without delay;
(2) the objective of and case for accounting standardisation;
(3) structure of the code of accounts and its manner of application;
(4) measures for bringing accounting standardisation into effect.

The report further contains six appendices, running in total to 51 of its overall 81 pages, as follows:

(1) the outline code of accounts, showing 10 classes, numbered 0 to 9;
(2) the schematic code (*Plan schématique*), setting out sub-classes and individual accounts to the three-digit level;
(3) the detailed code, setting out sub-classes and individual accounts to the five-digit level;
(4) model balance sheet;
(5) model trading account, alternatively for enterprises with or without perpetual inventory accounting;
(6) model profit and loss account, alternatively for enterprises with or without perpetual inventory accounting.

As far as can be determined, the accounting code in Chezleprêtre (1940) is closely similar to but not identical with the Goering Plan.[31] Tabled as the starting point for the deliberations of the *Commission du plan comptable*,[32] it had a defining effect on the work of the *Commission*. Through the subsequent meetings of the *Commission*, there were various amendments to the Chezleprêtre proposals but repeated reference is made to his report and views. The final *Plan comptable général* differs in a number of technical respects from his original report but the central concept of a code capable of universal application and one which integrated financial and cost accounting persisted throughout,[33]

Process Management

For the *Commission du plan comptable* to succeed by producing a scheme for a national accounting code within a tight timetable required effective management of a large and disparate working group. The President of the *Commission*, by its constituting Decree, was the Secretary General *pour les Questions Economiques*, a functionary attached to the *Ministère de l'économie nationale et des finances*. His role was perhaps intended to be no more than that of general oversight.[34] Effectively the Commission was directed by its Vice-President, who from its meeting on 19 June 1941 was Auguste Detoeuf. AEF minutes of the Commission under his chairmanship show that Detoeuf ran its business with a tight hand. Attempts by individual members to assert a higher moral or technical authority or to lead the *Commission* along a different path were brushed aside.[35] Important aspects of the work of the *Commission* were hived off to sub-committees, namely the *Comité comptable de rédaction du plan* and the *Sous-Commission des règles*.[36] The latter, formed at the *Commission* meeting of 10 July 1941, comprised 13 members, all of whom were public accountants apart from Chezleprêtre and one other who was an expert in the field of accounting (i.e. bookkeeping) equipment. The accountants were to be locked into the *Plan* by being given the task of drawing it up.

---

[31] I have not seen the text of the Goering Plan. It is not even clear from secondary sources what constitutes a definitive text of the Plan. A comparison of the 1942 French *Plan*, as set out in Mommen (1957, p. 85, showing accounts numbered to the two-digit level) and the version of the Goering Plan in English translation in Singer (1943, Appendix III, showing accounts numbered to the four-digit level), indicates that each has a codified structure for accounts organised in ten broad classes and that the purpose for which each successive principal class is to be used in the classification of accounting transactions is the same for both codes (e.g. Class 1: Capital and investments; Class 2: Financial accounts; and so forth). There are, however, many points of difference between the two codes at the two-digit level of account numbering (and by inference in successive sub-classes), e.g. Account 00 in the Goering Plan is reserved for buildings and Account 01 for land whereas, in the *Plan comptable général*, Account 00 is for both land and buildings (Account 01 in the latter being reserved for machinery and equipment).

[32] Minutes, 29 May 1941, p. 5, III-Etude du projet de M. Chezleprêtre, AEF documents.

[33] The resulting Plan is described by Richard (1988) as 'un plan de type moniste', closely linked in terms of its integration of financial and cost accounting with the ideas of Schmalenbach and the later accounting codes of the Soviet Union and East Germany.

[34] The Secretary General at the time of the *Commission* meeting of 29 May 1941 was M. Moreau-Neret who is listed as attending only one of the six meetings for which minutes have been sighted. The final report of the Commission, dated 10 March 1942, was addressed to the Secretary General, by this stage M. Filippi.

[35] At the meeting of 19 June 1941, one member, Camille Evezard sought to present a report of his own relating to the task of the *Commission*. Detoeuf dealt with this by asking Evezard to send it to the members. Subsequently Evezard circulated his report under cover of a letter of 3 July 1941. Its tenor, excruciatingly embarrassing to read even now, sought in the one breath to displace Chezleprêtre from the technical task, to substitute himself for this role and to genuflect before the Goering Plan. Subsequent minutes of the *Commission* do not rate his report a single mention.

More striking still as an indication of the division of roles between Detoeuf and Chezleprêtre, Detoeuf at the meeting of 29 May 1941 had argued strongly for requiring disclosure of sales revenue, a position successfully opposed by Chezleprêtre on technical grounds. Detoeuf thereafter is not shown as contributing to debate on technical issues.

[36] No minutes, working papers or records from either of these bodies have been sighted. The *Sous-Commission* is recorded in the *Commission* minutes of 29 May 1941 as having met on 23 May. Its task and membership are not known. Subsequent *Commission* minutes refer to its work and recommendations.

The outcome from the work of the *Commission* was in the first instance its printed report of 153 pages plus lengthy annexes, dated 31 December 1941, addressed as a confidential report to the President of the *Commission*. This document is in fact the proposed *Plan comptable général*. The final outcome was publication of the *Plan* (Commission Interministérielle, 1943), as a book of 227 pages. It is an astonishing achievement, given all the circumstances.[37] The following summary of the contents is set out to convey its scope and content:

Introduction:	Reasons for a national accounting code
Terminology:	Definition and explanation of terms
Ch. I:	General rules for the recording of transactions, the responsibilities of the *Comités d'Organisation* for development of industry adaptations of the *Plan*, and penalties envisaged in the proposed accounting law
Ch. II:	The chart of accounts, in two versions, for enterprises which account for cost of sales by means of product costing, and those which do not
Ch. III:	List of accounts, by classes
Ch. IV:	Definitions and rules for using and interpreting the function of the various detailed accounts within each class
Ch. V:	Particular accounting issues (e.g. foreign operations and foreign currency translation, enterprise activities using state-owned assets, extraordinary items, incomplete contracts)
Annexes:	Model profit and loss accounts, profit and loss appropriation accounts and balance sheets, with alternative formats for enterprises using product cost accounting for cost of sales purposes, and those that do not, together with model supporting accounting schedules (e.g. an allocation schedule)
Appendix:	Explanation and model schedules for use in calculation of production cost
List:	Items for the attention of *Comités d'Organisation* in drawing up industry adaptations of the *Plan comptable général*

Whilst much has changed through the years in the successive stages of evolution of the *Plan comptable général*, one cannot but be struck by the extent to which the current publication of the *Plan* (Conseil national de la comptabilité, 1986) retains much the same broad form and coverage in explanatory terms as found in the original 1942 *Plan*.

Winning Political, Bureaucratic, Professional and Business Acceptance

If the project for the *Plan comptable général* was to proceed other than by *diktat*, it is clear that concurrence would be required from disparate interest groups. The most obvious groups were:

(1) the Vichy politicians who above all, as they saw it, had somehow to placate the Germans whilst striving to preserve an element of French autonomy and self-respect;
(2) the bureaucracy which, almost regardless of the political tidal waves sweeping over them, would be responsible for operating the wheels of civic administration, such as tax assessment of business income and, if their political masters so decreed, price control;
(3) the professional accountants who would have to make a national accounting code work;
(4) the business community which would undoubtedly see the code as primarily serving interests of state and as being contrary to its need for commercial confidentiality and freedom for managerial decision.

For the purpose of sustaining political support for the project, Auguste Detoeuf was ideally placed. He rates seven index references in Kuisel (1981) and 16 in Ehrmann (1957) where he is identified (p. 47) as a director (evidently pre-war) of the heavy electrical manufacturing company, Alsthom, and more generally (p. 1) as industrialist and graduate of the Ecole Polytechnique. That he had an interest in aspects of accounting standardisation, though not himself an accountant, is shown by his involvement with CEGOS. Detoeuf was President of CEGOS at the time of its 1937 report on accounting for cost of production, to which he contributed the preface, 'Le problème des prix de revient' (Commission générale d'organisation scientifique, 1937).[38] Following the law of 16 August 1940 for establishment of the *Comités d'organisation*, he had been appointed to direct the Comité for electrical equipment (Kuisel, 1981, p. 137). He was personally known to Lehideux and was a member of a consultative committee appointed by Lehideux to assist in the work of economic planning undertaken by the

---

[37] The finally published work, printed by Editions Delmas, Bordeaux, is notable in book production terms. Printed on high quality paper, with elaborate coloured fold-out charts and diagrams, it belies the difficult publishing conditions of the time and is in striking contrast to the crumbling paper of many of the other wartime documents consulted.

[38] His contribution to the report is simplistic in the extreme. It is not hard to see why Detoeuf deferred to the technical expertise of Chezleprêtre in the work of the *Commission du plan comptable*.

Délégation générale à l'équipement national (Kuisel, 1981, pp. 147–148). Detoeuf opposed the general idea of economic liberalism which he saw as morally bankrupt and productive of social misery, a position argued in polemical fashion in a 1936 conference paper (reprinted, Detoeuf, 1982). From the evidence, it can be seen that Detoeuf was influential in a number of respects, linking the views of technocrats in industry with those of the bureaucracy and key modernist political figures of the Vichy Government, as well as being closely in tune with its strand of corporatist political philosophy.

In the bureaucratic domain Chezleprêtre seems to have been highly effective during the life of the project. He was assiduous in keeping his departmental superiors informed[39] and had access to his Minister, as indicated by direct despatch to the Minister of his letter of 23 March 1942, containing confidential commentary on the work of the *Commission du plan comptable*. The *Commission* report of December 1941 containing the proposed *Plan comptable général* was evidently subjected to examination within the *Ministère de l'économie nationale et des finances*, which raised a number of technical objections. The AEF document of 12 March 1942 shows that these were effectively overcome by Chezleprêtre. It seems unlikely that the tax authorities within the same Ministry had sufficient time to pass their fine combs through the *Plan* in terms of its fiscal implications. A much later AEF document of November 1943 deals with this aspect but by that stage of the war the whole issue was becoming largely academic.

The matter of gaining the support of the accounting profession was bound up with reform of the profession itself, which was reconstituted by the Vichy Government. Here the hand of the Germans seems more evident, even though the laws creating institutions for a number of the professions at that time fitted well enough with the corporatist philosophy of Vichy. By a separate Decree of 22 April 1941, the Government established the *Commission pour l'organisation de la profession d'expert-comptable*. The outcome was the institution of the *Ordre des experts comptables et des comptables agréés*, to which Chezleprêtre was appointed as *Commissaire du Gouvernement* (Cordoliani, 1947). The foundation President of the *Ordre* was Paul Caujolle (1891–1955) an *expert judiciaire*.[40] Caujolle was not a member of the *Commission du plan comptable* and played no direct part in the development of the *Plan comptable général*. His writings and activities during and after the war nevertheless show that he supported the concept of a national accounting code by conviction rather than necessity (Caujolle, 1942, 1943 and 1949). The effect of his role and the extensive involvement of highly regarded public accountants in the actual drafting of the *Plan*[41] appear to have provided a sufficient extent of professional commitment to the project.

The reaction of the business community, as judged from records located, was more diverse and harder to gauge. In the early stages of development of the Plan and its diffusion, there must inevitably have been much anxiety in the private sector about what it might portend in terms of state interference and direction. Viandier (1942) complains in the weekly *Bulletin de la Chambre de Commerce de Paris* that the Chambre had not been called on to participate in the drafting of the law for application of a national accounting code which he evidently assumed to be in course of preparation. Given the importance in France of the role played by Chambers of Commerce, especially the Paris Chamber, this could be viewed as an unwise omission from steps needed to secure acceptance for the *Plan* within the business community. On the other hand, July 1942, the month of his article, was only three months after the *Plan* had been presented to the Minister and months before its 1943 publication. The fears expressed by Viandier concerning the effects of a national accounting code concentrate on the likely use that would be made of it for purposes of tax administration and, more generally, on the loss of freedom that would be felt by managers in designing their accounts as they might wish. These issues were to surface time and again after the war.

Culmann, author of the preface in Péricaud and Calandreau (1943, p. 3) notes that the Decree of 22 April 1941 gave neither a definition of what might be understood by a national accounting code, nor an indication of its objective, nor a prescription of its general lines. He opined that, as between the extremely flexible and wide dispositions of the *Code de Commerce* as it then existed and the extremely detailed dispositions of the *Plan*, there would be almost a revolution. At numerous points in Péricaud and Calandreau (1943) reference is made to the future role of the *Comités d'organisation* in developing adaptations of the Plan appropriate to their members and to the *Commission permanente du plan comptable*, taken to have been an ongoing organisation to oversee implementation of the *Plan comptable général* or of industry adaptations as the case may be. Whether this latter *Commission* was duly formed and what it may have done are not known.

---

[39] AEF documents of 7 November 1941, and 6 February, 12 March, 23 March 1942.

[40] Caujolle was clearly the founding father of the *Ordre*. A large bust of him is still to be seen at the entry to its library at 88, rue de Courcelles, Paris.

[41] For example, Evezard, to whom reference was made in fn. 35, describes himself as President since 1936 of the *Syndicat national des experts-comptables de France et des colonies*.

In the event, Brunet (1951, p. 254) states that there was only one industry for which an adaptation of the *Plan* was produced, namely the *Comité d'organisation des industries aéronautiques ('Indaéro')*, and which was to be applied by enterprises in the field of aircraft production from 1 January 1944, as regards financial accounting, and to be extended from 1 January 1945 to cover cost accounting.[42] Brunet (1951, pp. 254–257) also mentions that the *Plan* affected many enterprises in three categories: makers of *cellules* (it is not clear to what this refers), producers of motors and manufacturers of spare parts. In addition, he states that a number of major enterprises adopted the Plan voluntarily (no details provided), without official measures being taken for its adaptation. Caujolle (1949, p. 22) refers to the aeronautic industry and the printing firm, Nab, as providing notable experiments in adaptation. Another example exists in a typewritten report by an accountant in Rheims presenting a proposed adaptation to an enterprise (whether as a class of enterprise or intended for a specific client is not clear) in the business of quarrying, manufacturing and trading in construction materials, transport and movement of goods by barge (Lecompte, 1943). Of wider significance is the circular from the *Comité d'Organisation du Bâtiment et des Travaux Publics* (1942) containing documentation for a one-day seminar in June 1942, organised by the building and public works industry for its member enterprises. The theme was the problem of accounting-based price determination in that industry, and the documentation includes a specific section on the ongoing evolution of the *Plan comptable général* and the role of the *Comité d'organisation* in its adaptation. These various references and sources lead to the surmise that there were a number of adaptations of the *Plan comptable général* by professional accountants, enterprises and industry committees seeking to respond to opportunities for interpreting the *Plan*, diffusing information about it and operating through the *Comités d'organisation* to make the code serviceable at industry level. Nevertheless, on balance it appears that the attitude of the business community toward the concept of a national accounting code was wary. If this is correct, that state of affairs may have been due in part to a failure to involve private enterprise more closely in the work of the *Commission du plan comptable*, a matter that could easily have been addressed through existing organisations such as the Chambers of Commerce.

Although the code proposed by the *Commission du plan comptable* had been submitted for official approval on 21 March 1942, the *Plan* was never promulgated (Brunet, 1945). An AEF document of November 1943 produced within the *Ministère des Finances*, 'Note sur les conséquences fiscales de la mise en application du Plan comptable', refers to an *arrêté* of 18 October 1943 to establish a *Comité d'adaptation du Plan comptable* for examining, coordinating and bringing up to date industry accounting codes and assuring their conformity with the rules of the *Plan* itself.[43] Brunet (1951, pp 254–257) records that this *Comité* was instituted by *arrêté* of 13 December 1943, comprising representatives of government and industry, but that circumstances prevented it from doing anything more than examining the aeronautic industry adaptation of the *Plan*. Notwithstanding these measures for consultation and cooperation, Brunet notes that the 1942 *Plan* provoked much hostility, partly due to its close association with the same *Comités d'organisation* which themselves were increasingly resented for their heavy handed direction and interference (see also Kuisel, 1981, pp. 132–144). The *Plan* seemed all too ready made, like its counterpart, the Goering Plan, to serve German needs. Lamson (1950, ch. X) observed that the moment was badly chosen for putting a national accounting code into effect since it was overshadowed by the circumstances of the Occupation.

Given these objections, the government evidently thought it best to refrain from giving the *Plan comptable général* official standing. A draft law to institute the *Plan comptable général*, presented with the report from Detoeuf in March 1942, was not taken up. Nor was a later shortened draft law which accompanied a report of February 1943 to the Minister.[44] In the increasingly tenuous conditions of government, the Vichy régime backed right away from the *Plan comptable général*. Even the de luxe publication of the *Plan* is vague about its provenance, confining itself to noting that the *Commission* had given permission for its commercial publication, but that the *Plan* had no official status.[45]

---

[42] Presumably its full effect, certainly as regards the second stage, was aborted by the liberation of France.

[43] Perhaps the *Comité d'adaptation* was the same body as the *Commission permanente du plan comptable* referred to in Péricaud and Calandreau (1943).

[44] This later report does not bear the name of an author, though it may not be fanciful to see in it the indefatigable hand of Chezleprêtre.

[45] The title page has no author or source of authority but merely states:

> Le Plan Comptable
>
> Projet de cadre comptable général élaboré par la Commission Interministérielle instituée par le décret du 22 avril 1941.

A reader without recollection of what that Decree might have been about would have been suitably mystified. To show even more definitely that the Government was distancing itself from the whole matter, the next page contains a warning: 'La publication du rapport de la Commission Interministérielle a été autorisée par M. le Secrétaire général pour les Affaires économiques au Ministère de l'Economie nationale et des Finances. Cette autorisation ne confère toutefois aucun caractère officiel à la présente édition, qui est réalisée sous la seule responsabilité des Editeurs'.

The picture that emerges from this sifting of fragmentary information does not support a characterisation of the process for developing a national accounting code as highly dictatorial, if that means one to be imposed against the wishes of those affected. There appears to have been a degree of enthusiasm for the project, at least among a group of senior technocrats with industrial experience and bureaucrats expert in economics and financial policy. Moreover, this enthusiasm manifested itself more as time went on and even as German interest in the project appeared to evaporate under pressure of events. The large network of *Comités d'organisation* was a structure for genuine consultation to elicit the particular accounting needs of given industries, albeit within the overall framework of the *Plan comptable général*. The membership structure of the *Commission du plan comptable* was heavily weighted, perhaps excessively so by present day standards, in favour of public policy and administration but it provided a useful degree of representation for private sector interests and especially for professional accountants who in the end would be left to carry out the *Plan*. Because the Vichy régime was increasingly caught in a fatally compromised relationship with Nazi Germany, disaffections against it and things German could easily have spilt over on to the project for a national accounting code and the accomplishments of the period. Yet what is striking from the early post-war literature is how little acrimony or recrimination the 1942 *Plan* and its associated policies seemed to generate or leave as a residue. In summary, the effective degree of consultation by the Vichy Government on the issue is hard to assess but there was clearly a significant interchange of views with some of the major interests concerned. That this is so is further supported by the involvement of members of the 1941 *Commission du plan comptable* in the post-war 1946 *Commission de normalisation des comptabilités*, constituted to propose a national accounting code appropriate to nationalised industries and the enterprises of the private sector.[46]

Epilogue

With the restoration of national government, attention turned to urgent tasks of post-war reconstruction. The difficulties to be faced were of kinds familiar everywhere at that time in the war-torn countries, notably rampant inflation, chronic shortages and a poorly maintained or badly damaged economic infrastructure. The mood was for political change. Possibilities of national economic direction and planning beckoned as a seemingly better alternative to the pre-war times of largely unregulated capitalism and economic fluctuation. The humiliation of the war years and an awareness of national vulnerability created a determination that the state should have a greater say in the operation of the economy and the performance of key sectors. If the government were to conduct its newly found economic responsibilities effectively, it would need to put its own accounting house in order.

In these conditions, the idea of a national accounting code and accumulated experience with the 1942 *Plan* provided the impetus for its recreation in indigenous terms. Following the report of the 1946 *Commission de normalisation des comptabilités*, a permanent statutory authority to be responsible for its implementation was established in 1947 and the code itself, still entitled the *Plan comptable général*, was promulgated later in 1947. Immediately following this, steps were taken to apply the *Plan* in the public sector, to nationalised undertakings and to enterprises receiving significant public subsidies. With these measures, the *Plan comptable général* was well and truly launched upon French social and economic life.

Of the three who had been so influential during the war in bringing about the *Plan comptable général* and gaining for it a measure of acceptance that survived those times, Chezleprêtre came under a cloud for what was judged to have been his collaboration with the Germans but survived it all to become Finance Director of the well-known department store, Bon Marché; Caujolle gained prominence as the leading light in organising the 1948 International Congress of Accountants in Paris, at which attention was given to the idea of an international standardised accounting code; and Detoeuf, who seems to have been universally liked, gained prominence in the affairs of the patronat.[47]

References

Brunet, A., *Rapport général, présenté au nom de la Commission de Normalisation des Comptabilités* (Paris: Imprimerie Nationale, 1947).

Brunet, A., *La normalisation comptable au service de l'entreprise, de la science et de la nation* (Paris: Dunod, 1951).

Brunet, C., 'Le plan comptable de l'occupation', *Bulletin fiduciaire* (No. 212, December 1945), pp. 47–53.

---

[46] Of the members of the 1941 *Commission du plan comptable*, Fourastié, later Professor at the *Conservatoire national des Arts et Métiers*, and Lemoine, a public accountant, were appointed to the 1946 *Commission de Normalisation des Comptabilités* and Parenteau and Léon were listed in its report as persons who had taken part in the work of that *Commission* (Commission de Normalisation des Comptabilités, 1947, Annexes II and III).

[47] He was also well-known as the author of what even today is regarded in France as a minor classic on managerial behaviour, published anonymously in 1938 under the title, *Propos de O. L. Barenton, Confiseur, Ancien élève de l'Ecole Polytechnique*, a collection of aphorisms.

Brunet, C., *Les principes d'établissement d'un plan comptable universel* (Paris: Société d'éditions professionnelles et techniques, 1948).

Cathala, P., 'Finance', in The Hoover Institution on War, Revolution, and Peace, *France during the German Occupation 1940–1944*, Vol. I (Stanford: Stanford University, 1958), pp. 78–100.

Cathala, P., 'Finance-Negotiations with the Germans, 1942–1944', in the Hoover Institution on War, Revolution, and Peace, *France during the German Occupation 1940–1944*, Vol. I (Stanford: Stanford University, 1958), pp. 101–127.

Caujolle, P., Principes généraux de comptabilité, et ce qu'il faut savoir sur le bilan (Paris: Centre de Documentation Universitaire, 1942).

Caujolle, P., 'Discours', *Bulletin de l'Ordre national des experts comptables et des comptables agréés* (Paris: No. 1, October 1943), pp. 7–10.

Caujolle, P., (Introduction to; authors unknown), *Le Plan Comptable; Elément de progrès économique* (Paris: Institut d'observation économique, 1949).

Cauvin, R., 'Historique et critique du Plan comptable général', in E. Archavlis, *Le Plan comptable général* (Marseille: Edition du Conseil Régional de l'Ordre national des experts comptables et comptables agréés, 1949), pp. 19–36.

Chezleprêtre, J., 'Normalisation des comptabilités', *Rapport présenté à la Commission de la Normalisation des Comptabilités* (Paris: mimeo, 1940).

Chezleprêtre, J., *Raisons d'être et modalités d'un plan comptable général* (Paris: Conférence faite à la Sorbonne, 1943).

Comité d'organisation du bâtiment et des travaux publics, *Le problème des prix dans le bâtiment et des travaux publics* (Paris: Comité d'organisation du bâtiment et des travaux publics, 1942).

Commission générale d'organisation scientifique (CEGOS), *Une méthode uniforme de calcul des prix de revient: Pourquoi? Comment?* (Paris: Commission générale d'organisation scientifique, 1937).

Commission Interministérielle, *Le Plan comptable* (Bordeaux: Editions Delmas, 1943).

Conseil national de la comptabilité, *Plan comptable général* (Paris: Conseil national de le comptabilité, 4th Edition, 1986).

Cordoliani, A., *L'Ordre national des experts comptables* (Paris: Sirey, 1947).

Culmann, H., *Le Plan comptable révisé de 1979* (Paris: Presses Universitaires de France, 1980).

Detoeuf, A., *Exposé sur le plan comptable* (Paris: Centre d'information interprofessionnel, 1941).

Detoeuf, A., 'La fin du libéralisme', in X-Crise, *De la recurrence des crises économiques: son cinquantenaire 1931–1981* (Paris: Economica, 1982).

Ehrmann, H., *Organized Business in France* (Princeton: Princeton University Press, 1957).

Elbow, M., *French Corporative Theory, 1789–1948* (New York: Columbia University Press, 1953).

Forrester, D., *Schmalenbach and After* (Glasgow: Strathclyde Convergencies, 1977).

Fourastié, J., *La comptabilité* (Paris: Presses Universitaires de France, 1943).

Fourastié, J., *Comptabilité générale conforme au plan comptable général* (Paris: Librairie générale de droit et de jurisprudence, 1945).

Fourquet, F., *Les Comptes de la puissance* (Paris: Encres, 1980).

Gaillochet, R., 'The "S" Factories', in The Hoover Institution on War, Revolution, and Peace, *France during the German Occupation 1940–1944*, Vol. I (Stanford: Stanford University, 1958), pp. 47–50.

Horace, A., 'Doctrine: Art. 5202, Le Plan comptable officiel de 1947', *Journal des Sociétés Civiles et Commerciales* (July–October 1948), pp. 201–240.

Kuisel, R., *Capitalism and the State in Modern France* (Cambridge: Cambridge University Press, 1981).

Lamson, J., *Principes de comptabilité économique* (Paris: Dunod, 1950).

Lauzel, P., 'Autres réflexions sur le plan comptable 1947', *Bulletin bimestriel de la société de comptabilité de France* (No. 144, March 1955), pp. 91–116.

Lauzel, P., 'Normalisation–rationalisation: Guides comptables', in P. Lauzel and A. Cibert, *Le Plan comptable commenté*, Tome II (Paris: Foucher, 1959), pp. 5–302.

Lecompte, R., *Projet préparatoire à l'adaptation du 'Plan comptable national'* (Reims: Privately prepared, 1943).

Lehideux, F., 'National Equipment', in The Hoover Institution on War, Revolution, and Peace, *France during the German Occupation 1940–1944*, Vol. I (Stanford: Stanford University, 1958), 35–38.

Lutfalla, G., 'Rapport présenté au nom du Conseil économique', in Conseil économique, *Mise en application du plan comptable* (Paris: Presses Universitaires de France, 1950), pp. 3–126.

Michel, H., *Pétain et le régime de Vichy* (Paris: Presses Universitaires de France, 1986).

Milward, A., *The New Order and the French Economy* (Oxford: Oxford University Press, 1970).

Mommen, H., *Le Plan comptable international*, Tome I (Brussels: Cambel, 1957).

Mommen, H., *Le Plan comptable international*, Tome II (Brussels: Cambel, 1958).

Ordre national des experts comptables et des comptables agréés, *Bulletin No. 1* (October 1943).

Paxton, R., *Vichy France: Old Guard and New Order, 1940–1944* (New York: Knopf, 1972).

Péricaud, J. and A. Calandreau, *Le Plan Comptable dans les entreprises* (Paris: Editions 'Le Commerce', 1943).

Retail, L., *Etudes critiques du plan comptable 1947* (Paris: Sirey, 1951).

Reymondin, G., *Bibliographie méthodique des Ouvrages en langue française parus de 1543 à 1908 sur la Science des Comptes* (Paris: Société Académique de Comptabilité, 1909).

Richard, J., 'Pour un plan comptable moniste français', *Revue de droit comptable* (March 1988), pp. 41–86.

Rousso, H., *Le Syndrome de Vichy (1944–198...)* (Paris: Seuil, 1987).

Singer, H., *Standardized Accountancy in Germany* (Cambridge: Cambridge University Press, 1943; reprinted New York: Garland, 1982).

The Hoover Institution on War, Revolution, and Peace, *France during the German Occupation 1940–1944*, Vols I–III (Stanford: Stanford University, 1958).

Viandier, P., 'Le Plan comptable', *Bulletin de la Chambre de Commerce de Paris* (Paris, 25 July 1942), pp. 182–190.

Villard, H., *L'Exactitude et la sincérité des bilans: le Plan comptable* (Paris: Sirey, 1947).

Weisz, G., *The Emergence of Modern Universities in France* (Princeton: Princeton University Press, 1983).

Zeldin, T., *France 1848–1945: Ambition & Love* (Oxford: Oxford University Press, 1979).

ACCOUNTING AND FINANCE

Vol. 30 *No. 1* *May 1990*

Explaining Intraperiod Accounting Choices: The Reporting of Currency Translation Gains and Losses
Stephen L. Taylor, Richard B. Tress and Lester W. Johnson
Some Evidence on the Term Structure of Interest Rates: How to Find a Black Cat When It's Not There
Ian Young and David Fowler
Partial Takeovers as Put Options
Neville Hathaway
The Effect of the Distribution of Cases on Judgmental Consensus
Ken T. Trotman
Market Timing Ability of Pooled Superannuation Fund January 1981 to December 1987
N. A. Sinclair
Education Notes
A Note on the Academic Performance of Deep-Elaborative Versus Shallow-Reiterative Information Processing Students
Kim Tan and Freddie Choo
The Place of Communication Skills in the Training of Accountants in New Zealand
Margaret C. McLaren
Book Reviews

ACCOUNTING AND FINANCE is published twice yearly in May and November by the Accounting Association of Australia and New Zealand. The membership fee is $28 per year and members receive the journal and any published supplement. Non members, i.e. libraries etc., can take out a subscription for the journal for $40 per year. Editorial correspondence should be addressed to Professor F. J. Finn, Editor, Department of Commerce, University of Queensland, Queensland, 4072, Australia. Applications for membership should be addressed to The A.A.A.N.Z., c/- Department of Commerce, University of Queensland, Queensland, 4072.

ISSN: 0810–5391

Accounting and Business Research, Vol. 20, No. 80, pp. 353–354, 1990

The Use of Computers in Accounting Courses: A New Perspective—A Comment

P. A. Collier, G. R. Kaye, B. J. Spaul and B. C. Williams*

Abstract—This comment examines the framework put forward by Er and Ng (*Accounting and Business Research*, Autumn 1989) and calls for a more radical re-evaluation of the role of computers in accounting education.

'The Use of Computers in Accounting Courses: A New Perspective' (Er and Ng, 1989) is the latest contribution to the debate on a subject largely initiated in the UK by Bhaskar (1982, 1983), although the general debate on the use of computers in education dates back at least to computer assisted learning projects like NDPCAL in the UK and PLATO in the USA. The main thrust of Er and Ng's paper is an attack on Bhaskar's classification which they claim is confusing. Their response is to offer a fresh look at contentious issues following recent developments in computing.

Their paper cannot remain unchallenged. We believe that their new classification fails to address what they portray as confusing in Bhaskar's work and fails to offer fresh insights into the issues by being fundamentally rooted in the technological context of the early 1980s. Their arguments appear to suggest a lack of grounding in key practitioner issues (both at education and accounting levels) through their use of an overly theoretical and technocratic perspective.

A new classification?

The most obvious and serious flaw in the Er & Ng paper is their confusion between pedagogy (science of teaching) and education (a process involving teaching and learning plus some undefinable quality of human inter-communication). Bhaskar's classification is described by Er & Ng as 'the use of computers in accountancy courses' whereas Bhaskar himself specifically addresses 'the ways in which computers may become involved in accounting education'. Taking Bhaskar's own definition, his framework represents a logical first stage (broad) classification of the impact of computers on accounting education. Admittedly, his categories might be modified as follows: Education Support Tools (previously CAI), Accounting and Business Support Tools (previously CCT) and Computing Science. Further subdivisions of these categories are possible and examples are illustrated in Figure 1.

Experienced taxonomists will recognise that this revised classification (like the periodic table) is not perfect. For example, networks involve programming as does database design. This is inevitable because taxonomies are only models of reality which act as devices or tools for learning. Er & Ng, however, seem to have sacrificed meaning in their quest for exactitude. In other words, in order to categorise the use of computers, it is necessary to look at them in action rather than from a distant and context free perspective. A good example is Sales System 1, which was categorised by Bhaskar as CS and Er & Ng as AIS and in fact was used in practice by Bhaskar to illustrate aspects of programming.

The placing of all the categories (ii) to (vi) in the Er & Ng classification on a par with Computing and Computer Aided Learning seems misguided and indicative of a deep epistemological misunderstanding since these categories clearly belong to the CCT or Accounting and Business Support Tools category. All represent modelling devices that may be used as one element to support decision making in addition to rules of thumb, intuition, political, social and other considerations. The abolition and subdivision of the Accounting and Business Support Tools category into five extra categories seems unnecessary and confusing unless seen from a narrow technique oriented pedagogic perspective.

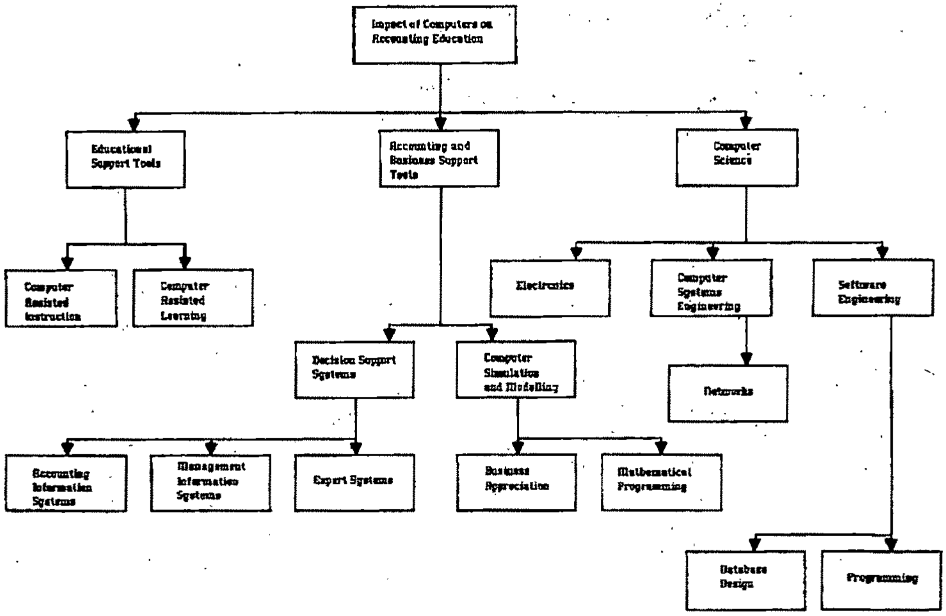
Integration

A second major problem with the Er & Ng paper is the wasted opportunity to reflect on the impact of computers on accounting education from the perspective of the late 1980s. It is clear that over

---

*The authors are, respectively, lecturer in accountancy, University of Exeter; director of CTI, Centre for Accountancy, University of East Anglia; lecturer in accountancy, University of Exeter; and lecturer in accountancy, University of East Anglia.

Figure 1
Revised Classification of the Impact of Computers on Accounting Education


Impact of Computers on Accounting Education
Educational Support Tools
Accounting and Business Support Tools
Computer Science
Computer Assisted Instruction
Computer Assisted Learning
Electronics
Computer Systems Engineering
Software Engineering
Decision Support Systems
Computer Simulation and Modelling
Networks
Accounting Information Systems
Management Information Systems
Expert Systems
Business Appreciation
Mathematical Programming
Database Design
Programming

the last decade, accounting and computing have become fully integrated and interdependent (ICAEW, 1989). To some extent, this understates the case. In fact developments in the late 1980s can be characterised by the absorption of accounting within a global concept of computer based information systems and in particular with the increasing recognition given to human factors within that discipline. This means that accounting education, if it is to be worthwhile, should take place within an organisational and technological context. It follows, therefore, that it is no longer appropriate to consider for example Accounting Information Systems, as defined by Er & Ng, in isolation because, in the current context, the majority of accounting systems would be Accounting Information Systems according to their definition. A similar problem applies to computer auditing.

In the 1960s and 1970s, it was possible, due to contemporary technology such as off-line batch processing, to conceptualise separate identities for accounting information systems and accounting and also for computer auditing and auditing. This is no longer the case following the introduction of integrated computer based information systems and it is unfortunate that Er & Ng fail to address this issue.

Summary

In defence of Er & Ng, it would be fair to argue that they have developed, with hindsight, one category of Bhaskar's original framework. However it would be wrong of them to claim that his original framework was flawed because their perspective (pedagogic) is different from his (educational). What is clear, however, is the need to re-evaluate the role of computers in accountancy education and we hope that this comment will stimulate some future debate.

References

Bhaskar, K. N. (1982), 'Use of Computers in Accountancy Courses', *Accounting and Business Research*, Winter.

Bhaskar, K. N. (1983), 'Computers and the Choice for Accountancy Syllabuses', *Accounting and Business Research*, Spring.

Er, M. C. and Ng, A. C. (1989), 'The Use of Computers in Accountancy Courses: A New Perspective', *Accounting and Business Research*, Autumn.

ICAEW (1989), *Examination Syllabuses—Consultative Paper.*

Accounting and Business Research, Vol. 20, No. 80, pp. 355–358, 1990

Restricting the Domain and Potential of Cash Flow Accounting

T. A. Lee*

Introduction

Staubus (1989) extends an earlier debate in this journal on the external financial reporting potential of cash flow accounting (CFA). As such, he builds on the conversations of Egginton (1984 and 1985), Lawson (1985) and Lee (1985). The argument expressed by Staubus relates to a need which he perceives to distinguish between the concepts of liquidity and wealth when considering the relative merits of alternative prescriptions for external financial reporting. His main conclusion on application of this argument to the CFA prescription is that CFA external financial reports have potential value for purposes of enterprise liquidity assessment. Staubus also concludes that such reports are unsuitable for assessing enterprise performance described in terms of wealth changes. These conclusions are similar to those of Egginton (1984 and 1985).

However, in advocating such a restricted role for CFA, Staubus appears to have damaged his argument by two significant omissions. First, he defines the general prescription for CFA reporting strictly in terms of historical or realised cash flows (HCFA) (implicitly at p. 161 and throughout, and explicitly at p. 163). Thus, the CFA reporting perspective which Staubus aims to provide is incomplete. For example, it does not contain, except in the briefest of comments, the total cash flow accounting (TCFA) prescription of Lee (1981 and 1984).

Second, Staubus fails to critique either HCFA or TCFA (or, indeed, any other form of accounting mentioned in his paper) in the context of an *explicit* statement of qualitative accounting criteria. Thus, it is difficult for his reader to judge the fairness of his analysis without a framework of reference which has become a familiar feature of other normative accounting contributions in recent times (for example, FASB, 1980; Lee, 1984; McMonnies, 1988; Solomons, 1989; and Sterling, 1985).

The contention of this comment is that these specific omissions by Staubus tend to bring into question the credibility of his argument and conclusions on the reporting potential of CFA—particularly with respect to his restriction of that potential to a narrow liquidity role. The purpose of this comment, therefore, is to identify and discuss further the above mentioned omissions in order that Staubus' paper can be judged more fairly. This seems to be important at a time in the history of external financial reporting when CFA prescriptions are achieving a measure of professional recognition. For example, CFA in its HCFA format is now an important part of North American external financial reporting systems (CICA, 1985; and FASB, 1987). And the potential of a recommended external financial reporting system containing several of the main features of TCFA is currently being evaluated in a long-term research programme of a major professional accounting body following published proposals (McMonnies, 1988).

The Staubus argument

Staubus considers the external financial reporting potential of CFA in the context of the investment decision (p. 161). He thus does not review other decisions which may or may not suggest a need for a CFA based information input. This could be argued to be a significant limitation of Staubus' critique of CFA. But, given the need to keep this comment within reasonable bounds, his restriction is accepted.

The argument of Staubus is that the investor is concerned mainly with decisions relating to a trade off which has to be made by him or her between present and future consumption of enterprise wealth (pp. 161–2). In particular, the investor is perceived to be concerned with the enterprise's capacity to convert potential into direct consumption purchasing power, thereby creating an interest in the prediction of cash flows (p. 162). Staubus goes on to describe enterprise wealth for accounting purposes in terms of the economic characteristic of cash flow potential (p. 162), and he defines the latter as the market value of a future stream of cash flows (p. 162). In addition, Staubus states enterprise performance to be measurable in the form of the periodic change in cash flow potential (p. 163). Not unreasonably, therefore, given these perceptions and definitions, Staubus suggests that what is required in external financial reporting is information which assists the investor to predict enterprise cash flows specifically, and to assess enterprise performance generally in terms of wealth changes reflecting cash flow potential (p. 162).

---

*The author is professor of accountancy and finance at the University of Edinburgh.

The above conception of the investment decision *vis-à-vis* external financial reporting and cash flow potential is consistent with a variety of related prescriptions by theorists and practitioners in recent years. For example, it can be seen with respect to general frameworks for reporting specified by accounting institutions (AICPA, 1973); and within specific reporting recommendations by individual accountants (Chambers, 1966; Johnson and Storey, 1982; Lee, 1984; and Sterling, 1979). In other words, the economic phenomenon commonly perceived for purposes of recognition in external financial reports is a description of the stock and flows associated with the cash flow potential of the reporting enterprise.

Liquidity, on the other hand, is perceived by Staubus as an intangible quality of the reporting enterprise (that is, as distinct from the tangible features of its liquid assets) (p. 164). He describes liquidity at length in terms of the reporting enterprise's short-term capacity to meet its debts and other obligations in cash, having taken into account the economic consequences to the enterprise of realising its assets in order to make the required cash outflows (pp. 164–5). Thus, it is apparent from Staubus' argument that he perceives enterprise liquidity in terms of readily available realised and realisable cash flows. In contrast, he conceives of enterprise wealth in much more uncertain and long-term cash flow terms.

Perhaps not surprisingly, therefore, Staubus concludes that HCFA should be useful to an investor assessing enterprise liquidity, that is, with HCFA providing information describing the reporting enterprise's past ability to pay, and being useful as a basis for the investor to predict its future ability to pay (pp. 164–5). In addition, Staubus regards HCFA as incapable of assessing performance in terms of enterprise wealth changes because such a reporting system does not report adequately on cash flow potential, and does not provide profit data based on periodic changes in such potential (pp. 165–6).

These conclusions on CFA's reporting potential, however, are incomplete. It cannot be disputed that HCFA does not and cannot provide the investor (or any other report user for that matter) with information beyond that which relates to enterprise liquidity (a point expressed by Lee in various papers on CFA since 1972—for example, in Lee, 1978). Indeed, the restricted reporting domain and potential of HCFA was a major reason for the advocacy in the early 1980s of the TCFA proposal (Lee, 1981 and 1984). TCFA specifically incorporates wealth and wealth changes, and uses the notion of cash flow potential in the form of net realisable values (NRVA). In addition, the cash flow theorists attempted to extend the utility of HCFA beyond liquidity in their earlier recommendations for cash flow forecasts (for example, Lawson, 1971; and Lee, 1972). In other words, each such cash flow proposal was deliberately intended to take CFA beyond the liquidity domain of HCFA, and to incorporate the equally important issue of enterprise performance assessment.

Flaws in the Staubus argument

As the previous section of this note has attempted to indicate, the Staubus argument to restrict the external financial reporting domain and potential of CFA to enterprise liquidity assessment is flawed because it examines only the HCFA variant of CFA. The consequences of this restriction for the credibility of Staubus' overall judgment of CFA are twofold.

First, and as already mentioned above, the TCFA proposal, which incorporates HCFA and NRVA prescriptions into an articulating system of CFA reports, is not considered by Staubus, except very briefly in his comment on the potential of TCFA in certain domestic circumstances (p. 167). The capability of TCFA to provide information on realised and unrealised cash flows, as well as wealth and wealth changes, is thus ignored in enterprise situations. Put differently, the capacity of TCFA-based external financial reports to describe and explain both enterprise liquidity and enterprise wealth aspects appears to have been missed by Staubus.

The reason for this significant omission in his critique of CFA is not clear, but it could be put down to Staubus' apparent belief that aggregates of NRVA data are not relevant to investors in business enterprise situations, as investors are not primarily concerned with the liquidity of the enterprise nor with the liquidity of its individual asset parts (p. 167). But this ignores the argument expressed by a variety of writers at different times concerning the relevance to investors and other report users of having information concerning the overall adaptability or command over resources of the reporting enterprise—see, for example, Chambers (1966), Sterling (1979) and Lee (1984). As adaptability or command over resources depend on cash flow availability, Staubus does not appear to appreciate that the TCFA system (as well as more conventional NRVA systems) has the capacity to comment on the cash flow potential he is so anxious to see reported externally.

Second, and again as mentioned previously, the evaluation of external financial reporting prescriptions is commonly undertaken nowadays in terms of specific accounting criteria of a qualitative nature. This ensures coherence in a critique in the sense that the evaluator and his readers have a frame of reference with which to test the quality of the prescriptions. In the case of Staubus, it is not clear what are his frame of reference generally and his criteria specifically. In other words, in the case of CFA, Staubus appears to have failed to make explicit his accounting criteria.

Indirectly or implicitly, he seems to be relying on the concept of relevance (in the sense of stating his conclusion about the potential of HCFA in terms of decision utility) (p. 162 and elsewhere). And he also could be using implicitly the concept of reliability (in the context of his comments concerning the measurement frailties of CFA data such as operating cash flows (pp. 165–6) and of NRVA data (pp. 164–5)). Indeed, if Staubus' previous work in this area is considered (for example, Staubus, 1977), it is very clear that his main accounting criteria are relevance and reliability, and particularly that he is prepared to trade off one with the other to obtain an optimum package of reported information (Staubus, 1977, p. 43). Thus, it can be argued that Staubus would only use NRVA data in circumstances where these were relevant and could be prepared reliably to express cash flow potential. This could explain his comments on the use of a mixture of exit prices and old and new entry prices in reporting situations (pp. 166–7), and his apparent reluctance to review either NRVA or NRVA within TCFA as a complete system.

Staubus' (1977) acceptance of the accounting criteria of relevance and reliability, and his arguable continuing acceptance of them in 1989, is consistent with accounting theorists prescribing either CFA or NRVA external financial reporting systems (for example, Chambers, 1966; Sterling, 1979; and Lee, 1984). The difference, however, between Staubus and these writers concerns the issue of criteria trade off.

Staubus would appear to regard trade offs as necessary and acceptable. Thus, a matter such as the use of net realisable values is put by Staubus into the context of occurring in external financial reporting only when it appears to be of some relevance and can be achieved with at least some reliability. Other writers, on the other hand, disavow trading off, that is, they believe both relevance and reliability have to be achieved in each reporting circumstance. This attitude colours their reporting advocacies under the labels of NRVA and TCFA, that is, the data to be reported in the latter systems are regarded by their prescribers as the only ones which can describe enterprise liquidity *and* wealth *both* relevantly and reliably. The pity is that Staubus (1989) does not specify his criteria, and thereby relate the latter to *all* variants of the CFA case. If he did, it would be easier for his readers to judge the fairness and the comprehensiveness of his critique of CFA.

Conclusions

The longevity of the conventional historical cost accounting system in external financial reporting, despite its widely acknowledged faults, makes the prescription of alternative systems an important exercise—despite the contrary views of researchers such as Watts and Zimmerman (1979). Change can only come from ideas which are formulated by individual researchers, and thereafter discussed openly and publicly. Such discussion ought to take place in a way that avoids limitations, restrictions and omissions which prevent a 'fair game' being played. Otherwise, it is too easy for the work of normative accounting theorists to be categorised as merely a 'market for excuses' by writers such as Watts and Zimmerman.

Staubus (1989) does not appear to be operating a 'fair game'. His paper is stated to be a critique of CFA but has been limited to an evaluation of HCFA. At no time in the critique has any aspect of CFA been explicitly judged in terms of *stated* accounting criteria. The result is that the case of TCFA (or, indeed, NRVA) as a means of dealing with wealth and wealth changes has not been considered, particularly from the point of view of an economic attribute which Staubus and the CFA advocates appear to have in common, viz. cash flow potential.

References

American Institute of Certified Public Accountants, *Objectives of Financial Statements*, AICPA, 1973.

Canadian Institute of Chartered Accountants, 'Statement of Changes in Financial Position,' *Accounting Recommendations*, 1985, pp. 1540.07–21.

R. J. Chambers, *Accounting, Evaluation and Economic Behavior*, Prentice-Hall, 1966.

D. A. Egginton, 'In Defence of Profit Measurement: Some Limitations of Cash Flow and Value Added as Performance Measures for External Reporting,' *Accounting and Business Research*, Spring 1984, pp. 99–111.

D. A. Egginton, 'Cash Flow, Profit and Performance Measures for External Reports: A Rejoinder,' *Accounting and Business Research*, Spring 1985, pp. 104–12.

Financial Accounting Standards Board, 'Qualitative Characteristics of Accounting Information,' *Concepts Statement 2*, FASB, 1980.

Financial Accounting Standards Board, 'Statement of Cash Flows,' *Statements of Financial Accounting Standards 97*, FASB, 1987.

L. T. Johnson and R. K. Storey, *Recognition in Financial Statements: Underlying Concepts and Practical Conventions*, FASB, 1982.

G. H. Lawson, 'Cash Flow Accounting,' *Accountant*, 28 October 1971, pp. 586–9; 4 November 1971, pp. 113–9.

G. H. Lawson, 'The Measurement of Corporate Performance on a Cash Flow Basis; A Reply to Mr Egginton,' *Accounting and Business Research*, Spring 1985, pp. 99–108.

T. A. Lee, 'A Case for Cash Flow Reporting,' *Journal of Business Finance*, Summer 1972, pp. 27–36.

T. A. Lee, 'The Cash Flow Accounting Alternatives for Corporate Financial Reporting,' in C. Van Dam (ed.), *Trends in Managerial and Financial Accounting*, Vol. 1., Martinus Nijhoff, 1978, pp. 63–84.

T. A. Lee, 'Reporting Cash Flows and Net Realisable Values,' *Accounting and Business Research*, Spring 1981, pp. 163–70.

T. A. Lee, *Cash Flow Accounting*, Van Nostrand Reinhold, 1984.

T. A. Lee, 'Cash Flow Accounting, Profit and Performance Measurement: A Response to a Challenge,' *Accounting and Business Research*, Spring 1985, pp. 93–7.

P. N. McMonnies (ed.), *Making Corporate Reports Valuable*, Kogan Page, 1988.

D. Solomons, *Guidelines for Financial Reporting Standards*, Institute of Chartered Accountants in England and Wales, 1989.

G. J. Staubus, *Making Accounting Decisions*, Scholars Book Co., 1977.

G. J. Staubus, 'Cash Flow Accounting and Liquidity: Cash Flow Potential and Wealth,' *Accounting and Business Research*, Spring 1989, pp 161–9.

R. R. Sterling, *Toward a Science of Accounting*, Scholars Book Co., 1979.

R. R. Sterling, *An Essay on Recognition*, University of Sydney, 1985.

R. L. Watts and J. L. Zimmerman, 'The Demand for and Supply of Accounting Theories: The Market for Excuses,' *Accounting Review*, April 1979, pp. 272–305.

Book Reviews

Company Accounts. *Roger Oldcorn.* Macmillan, 1989. x + 195 pp. £14.95 HB. £5.95 PB.

This is a short book, of less than 200 pages, which seeks to take the reader from a state of total ignorance about accounting to the ability to carry out a basic analysis of a set of published financial statements. In general, it is very clearly written and presented, and is obviously designed to avoid intimidating a naive and timorous reader. One problem in reviewing the book, however, is the absence of any indication, by either author or publisher, of the target readership. The presentation in the initial chapters is so simplistic, and assumes so little knowledge of the business environment, that one might imagine that it was addressed to a readership of not particularly bright school children. This impression is reinforced by the somewhat whimsical or facetious names given to the examples used in these chapters. Occasionally, the book crosses the border line between simplification and error. For example, on page 19 it is stated that 'goodwill is the excess of purchase price over the valuation of a business on the date of acquisition'. This is clearly absurd; goodwill is not an amount over and above the valuation, it is the amount by which the valuation of the business as a whole exceeds the values of the individual assets less liabilities excluding goodwill. The further comment, that goodwill is worth having but cannot be turned into money, is misleading; and to say that goodwill has worth but no value is not particularly helpful. Goodwill is a 'non-severable intangible asset', and as such can be turned into money only by selling the business.

The distinction between fixed and current assets on page 17 is, likewise, not very felicitous. It is not clear that debtors, for example, are 'used up by the business'. An understanding of the difference between current and fixed assets requires an explanation of the role of working capital in a business; such an explanation is provided brilliantly in the video cassette with John Cleese and Ronnie Barker. The same cassette also stays on the right side of the dividing line between humour and facetiousness. Another infelicity in the explanations on page 17 is the comment that the non-current assets seem somehow to be much more substantial than the current assets. Are investments in other companies much more substantial than stocks of materials or finished goods?

On the whole, however, the book avoids pushing over-simplification into downright error. In fact, it has a number of attractive features, such as self-check questions, and a useful quiz starting on page 82.

My main doubts about the book, therefore, relate to the identification of its intended readership. The reader is taken to the point where simple analysis of published financial statements is undertaken. The style of the book seems to suggest a reader who is not informed about the business environment, company law, etc. Nor does the book set out to remedy this kind of ignorance. One wonders, therefore, with what degree of genuine understanding a person having read this book would be able to perform such an analysis. The example of a real set of accounts given at the end of the book includes the note on accounting policies and all the other notes, including one relating to litigation. But the book has not really prepared a reader to handle information of this type, nor does it supply any commentary to assist the reader when this material is reached.

I cannot see myself using this book as an introduction to company accounts, either in university courses or on executive programmes. This is partly a matter of taste; particularly in the case of executive programmes, I should be afraid that participants would find the style rather condescending. But I also feel that the book has weaknesses in content which I have tried to indicate. There are several other books which offer an introduction to company accounts. Of these, perhaps the most comprehensive is the book by Reid & Myddleton, published by Gower Press. Slimmer volumes have been published by R. H. Parker and by P. A. Bird. Mr Oldcorn's book is probably more comprehensive than the latter two, in that it starts at the very beginning of understanding accounting. So does the book by Reid & Myddleton, but it does so at less danger to appearing to insult the reader's intelligence, and it provides a more comprehensive bridge between the over-simplifications necessary to get started and the more sophisticated understanding required to perform a knowledgeable analysis of a set of published accounts.

University College of North Wales — Simon Archer

CALCUTTA CENTRAL

Expert Systems in Accounting. *Alex Edwards & N. A. D. Connell.* Prentice Hall, 1989. 272 pp. £30.

The development of artificial intelligence in its many forms is likely to have an extremely significant effect on all professions before the end of the century, accounting included. One particular strand of artificial intelligence, expert systems, looks especially promising in its benefits for accounting.

This book is the result of the efforts of Alex Edwards, Con Connell and a team based at Southampton University. Dr Edwards headed a project set up in 1985 by the ICAEW. Their task was to undertake a study of the current role of expert systems in relation to accounting and to develop an expert system in the area of the assessment of business risk.

The book is aimed at the non-specialist or student reader who wants a greater understanding of expert systems and their role in accounting, and also at the accountant who intends to develop his own expert system.

These two target groups are identified in the organisation of the book into two parts. Part one of the book is divided into five chapters and provides an introduction to decision support systems and expert systems. Chapter one outlines the history and development of expert systems. Chapter two looks at the role of decision support in accounting, differentiating between decision support and expert systems. In chapter three the reader is given some background knowledge of the structure and terminology of expert systems. Chapter four focusses on expert systems in accounting, while chapter five suggests the future of expert systems in accounting.

Part two is divided under six headings: developing an expert system, the application domain, the knowledge elicitation experience, the demonstrator, the tools used, and conclusions. This part of the book deals with that part of the ICAEW research project that was concerned with the development of the expert system prototype.

Aside from the main text the book has five appendices which include the results of several surveys into the use of expert systems and decision support systems in accounting.

Anyone who is interested in the effect of IT on accounting must eagerly anticipate reading a book with the title of this volume and it is true to say that this book does provide the best overview of the subject to date. However there are several strong reservations that must be made about the coverage of the subject in this text. Firstly, the use of non-rule-based expert systems using Bayesian statistics or fuzzy logic has not been given the coverage that one would have hoped for in a book of this nature, nor have the possibilities of neural networks or other hardware developments such as parallel processing been explored. These comments are not solely made as a criticism of this particular book, but as a general point on publishing material in this area in book form. All these developments are now well documented, but the speed of the publishing process at present means that in an area of fast changing technology such as expert systems a book is almost out of date before it hits the bookshelf. This text is starting to show its age already.

My second reservation is one of attitude rather than content: I found that in general the authors' view of expert systems was rather uncritical. Areas of real academic debate on the viability and usefulness of expert systems in a judgmental scale environment such as accounting, rather than a domain where answers could be expressed in a binary or yes/no format, were not addressed. Yet this and several other areas of debate are key to the development of useful systems within accounting and indeed within the social sciences.

The third reservation deals with the two target groups that this book is aimed at. There is a danger that when one aims at two targets so far apart one may miss both. This is not the case with this book, but of the two groups the expert systems developer seems to have been the main target. Any accounting based expert systems developer would undoubtedly find this book essential reading. To satisfy the general or student reader fully, the first part needs considerable expansion to give a balanced and critical view of expert systems in accounting.

Despite these strong reservations this book should find a place on many reading lists and library shelves. It is not a book for the expert or specialist, but it provides the best coverage of this subject area available in clear and non-technical language.

Barry Spaul University of Exeter

Financial Reporting: An Accounting Revolution. *William H Beaver.* Prentice-Hall International, 2nd edn., 1989. xvi + 204 pp. £15.95.

This is the second edition of a book which first appeared in 1981 and forms part of Prentice-Hall's 'Contemporary Topics in Accounting Series', a series aimed at providing summaries of the most recent findings in the research literature by leading scholars in the field in a concise form for the student market.

The book was widely reviewed at the time of its first appearance. The preface to the first edition explicitly states that it is a personal perspective of the financial reporting environment and admits that no attempt has been made to provide a comprehensive treatment of other perspectives;

this remains true of the second edition as well. The author engagingly admitted in that first preface that 'the source materials referenced show a strong "Beaver" bias' (also true of the second edition). He is similarly unusually honest in the preface to the second edition: 'Were I to spend resources in a major textbook effort, it would more likely be in a different text rather than a major revision of this text'.

The structure of the book is unchanged. As before, it consists of seven chapters, the first explaining why Beaver thinks that the changes which have occurred amount to a 'revolution' (the shift from an economic income to an informational perspective, increased recognition of the complexity of the environment and the role of the professional user, etc.). The next three deal, respectively, with financial information provision generally from a financial economics perspective, earnings measurement under certainty and under uncertainty. This is followed by two chapters summarising empirical research findings on the relationship between reported earnings and security prices and the theory, evidence, and implications of the concept of market efficiency. The final chapter sets out the arguments for and against the regulation of financial reporting.

Almost uniquely for a revised version of a book, the second edition is of exactly the same length as the first. This is explained, in part, by the fact that large chunks of the book are carried over unchanged, except for small amounts of rewording, deletion and updating. The author has, however, incorporated fresh evidence, plus details of new theoretical advances, notably in the areas of costly contracting, signalling and regulation. This book does not suffer the usual fault of revisions, namely, a flabbiness from trying to incorporate a host of new developments without discarding large chunks of the original. Beaver's book remains what it was: a scholarly review of a complex area.

Part of the reason for this is that the passage of time has not greatly dented the original idea underlying the book, viz. the adoption of an informational perspective. Firms have incentives to provide information, including accounting information, to the financial markets, and this demand has been supplemented by regulatory actions. To the extent that financial reporting in America is largely determined by the demands of investors—a proposition which underpins the Trueblood Report and the FASB's conceptual framework—this approach provides an excellent basis for examining financial accounting. Nevertheless, it has to be said that Beaver himself is less than fully satisfied by the ability of an information perspective to explain the kinds of things that accountants concern themselves with: 'The efficacy of accrual accounting still remains essentially an open issue' (p. 102). Beaver has deliberately chosen not to cover recent developments in the contracting literature which attempt to explain the observable characteristics of practice (balance sheets, income statements, reliance on historical cost, audit, etc.) in terms of bonding and monitoring of managerial performance. In this respect, the new version complements Watts and Zimmerman's *Positive Accounting Theory*, which came out after the first edition of Beaver's.

To summarise, the book continues to provide what it previously did, an excellent summary of the research literature on the 'product characteristics' of American published financial statements viewed from a financial economics perspective. It could be argued, of course, that a no less important 'revolution' has occurred in the quantity, nature and standardisation of the accounting information published by modern companies in the USA and elsehwere. For this readers will continue to have to look elsewhere.

As before, some readers might be irritated by Beaver's continuing claim that the adoption of an informational perspective in preference to an economic income one constitutes a 'revolution'. After all, Alexander explained as long ago as 1950 the problems with economic income under conditions of uncertainty and suggested that different measures of income might be best for different purposes. Ronald Edwards (1938) before him, and Edwards and Bell (1961) and Chambers (1966) afterwards, too, were aware of the difficulties and concerned to base their proposals on essentially informational perspectives. The lack of historical perspective on the development of accounting thought is the (far from trivial) price paid by American academe for the considerable advances it has made by exploiting the theories and empirical methods of modern economics in accounting research. As Beaver would probably be the first to admit, nothing comes free in this world.

Lancaster University K. V. Peasnell

Discounting in Corporate Financial Reporting. *Christopher Lovejoy, Ken Peasnell, Paul Taylor, and Yusuf Talukdar.* ICAEW Research Board, 1989. 97 pp. £10.

The time value of money in external financial reports has been receiving increasing attention in recent years. The importance of the interest factor in accounting for long-term liabilities such as pensions and other post-employment benefits, in accounting for leases, in valuing oil and gas reserves, and in dealing with new types of financial instruments such as deep discount bonds, as well as in other situations, has forced the subject out into the open. The FASB added a project on interest methods to its agenda in October 1988. The appearance of the present research study, commissioned by the Research Board of ICAEW and conducted by the International Centre for Research in Accounting at Lancaster University, is therefore timely.

The study is divided into five chapters. An executive summary is followed by a chapter discussing the general principles underlying the use of discounting in financial accounting. Then the place of discounting in UK and US accounting standards and other official pronouncements is examined. The fourth chapter reports on the results of a sample survey of financial reporting practices that the research team conducted. The study concludes with an examination of a number of examples of financial reporting practices involving (or in some cases surprisingly not involving) discounting.

The discussion of general principles in chapter 2 occupies 15 pages. This is hardly enough to do the subject justice, but because the sparse treatment is quite well done one is left wanting more. An important conclusion of the study is that 'a strong case exists for making market based rates appropriate to the individual assets and liabilities the normal basis for discounting across most accounting applications' (p. 22). However, there is always a danger of double-counting when discounting, and this danger is appropriately recognised. If the amount and timing of future cash flows have been estimated conservatively to allow for uncertainty, a risk-free rate may be used. If inflation has not been allowed for in making estimates, then a real, not a nominal, interest rate is appropriate.

Chapter 3 provides a useful survey of the main areas where discounting is referred to in UK and US standards and other official pronouncements. The survey reveals more resort to interest methods than is generally supposed, especially in the US. The study finds that 'discounting plays a larger role in American accounting standards than in their British counterparts. Generally, what is recommended as best practice in the UK is mandatory in the USA. In some other areas, where discounting is mandatory in the USA, UK pronouncements caution against its use (e.g. in oil and gas accounting). Whether this is because of conflicting views of best practice or because of resistance to change is difficult to say' (p. 53).

The sample survey of financial reporting practices, discussed in chapter 4, is the weakest part of the study. The sample was made up of 723 companies, of which 385 (53%) provided usable responses. The questionnaire contained only three questions about the company's use of discounting, and a minimum response required only a few ticks. The response rate was therefore somewhat disappointing. The questionnaire was not pilot tested, and apparently many companies did not understand what was meant by 'using discounting'. Moreover, 'the lack of a "not applicable" column did not permit a distinction to be drawn between this and negative responses' (p. 58). There were some marked discrepancies between the survey results and what was gleaned from an analysis of the financial statements supplied by the surveyed companies. The questionnaire results are probably too untrustworthy to be useful; but the researchers are to be congratulated on the candour with which they acknowledge the survey's deficiencies.

This is the third study on discounting to be published during the last two years, and curiously (probably because of the timing of the publications) none of them lists the other two in its bibliography. In 1988 the Canadian Institute of Chartered Accountants published J. Alex Milburn's *Incorporating The Time Value of Money Within Financial Accounting*, and in 1989 the Financial Executives Research Foundation published *Discounting in Financial Accounting and Reporting*, by Aggarwal and Gibson, in the US. The three books are complementary rather than competitors. Milburn's book is by far the most rigorous theoretically, and the only one to attempt to build a complete model based on discounting, complete with many numerical illustrations. Aggarwal and Gibson provide a survey of the literature. Lovejoy, Peasnell *et al.* is the only one of the three to provide any empirical results, albeit in part defective ones as noted above. All three books will repay study by anyone who seeks a better understanding of this increasingly important aspect of financial reporting.

University of Pennsylvania David Solomons

Accounting Harmonisation in Europe: Towards 1992. *C. Nobes.* Financial Times, 1990. vi + 126 pp. £135.

This report is not an academic text which, given its price, is just as well; rather it is designed to be 'useful to accountants and managers in general'. It is divided into six main chapters. Chapter 2 describes the probable causes of differences in financial reporting in the EC. The third chapter examines the major differences in annual accounts in the EC. Particularly important areas are the relative scarcity of consolidation in many countries, the use of different valuation methods, and the greater conservatism in several EC countries, as illustrated by extracts from German accounts and the use of different formats. This is not simply a presentation problem, but rather affects the quantity of information provided as illustrated by copious examples. Chapter 4 provides a fairly standard reiteration of the arguments in favour of harmonisation and the obstacles to such harmonisation. Given the earlier arguments that financial reporting differences often reflect substantive and long lasting environmental differences, the possibility of a dual system of reporting with international rules applying only to large or quoted companies is suggested. However, while such an approach has certain attractions the argument is not developed.

Chapters 5 and 6 look at the Fourth and Seventh Directives and are the most detailed and informative parts of the report. An interesting feature is the explanation of the derivation and evolution of each Directive. Particular emphasis is placed upon illustrating the influence of Germany on the Fourth Directive and the changes made to the earlier drafts to satisfy very different Anglo-Dutch views on true and fair and asset valuation. Useful tables are given detailing the main provisions and options and the source countries of these requirements. Chapter 7 explores the effects of the other EC Directives. It concentrates, in particular, on the Vredeling Directive and the Fifth Directive which would introduce fairly detailed rules regarding consultation with employees, an area relatively underdeveloped in the UK. Thus, if approved, they are likely to have a fairly major impact in the UK.

Due to the fairly detailed rules pertaining to disclosure in the UK, in particular with respect to consolidated accounts, the EC harmonisation programme has had far less effect on legislation than it has in most EC countries. However, it has led to some important changes in UK Company Law and accounting practice. The final chapter looks at these effects. Tables of the changes in the UK caused by Directives and the possible UK effects on the Directives are provided. In addition several areas still giving rise to problems are briefly described. The Directives have caused conflicts between SSAPs and company law, for example in the area of stock valuation and goodwill. Other areas still need to be considerably tightened if comparability is to be achieved, major problem areas being the use of different asset valuation methods and lack of comparability across the various formats allowed.

Given the stated objective to 'prepare accountants for forthcoming changes' one curious omission is the failure to discuss whether or not 1992 will affect reporting, while only passing mention is made of a proposal to set up an EC-wide standard setting body rather than relying solely upon further Directives. However, this remains a well-written, easy to read guide to the status of current harmonisation attempts which meets most of the objectives the author sets himself.

Clare Roberts University of Glasgow

The Information Content of Unexpected Accounting Income, Funds Flow and Cash Flow: Comparative Evidence for the US and UK Economies. *J. L. G. Board, J. F. S. Day and M. Walker*, Institute of Chartered Accountants in England and Wales Research Board, 1989. 17 pp. £10.

This study examines the strength of the relationship between unexpected changes in accounting performance and share price movements for three alternative accounting measures of firm performance: historic cost accounting income, funds flow, and cash flow. The definitions of the three accounting measures are summarised by the two identities:

$$\text{Accounting Income} = \text{Cash Flow} + \text{Current Accruals} + \text{Long-term Accruals}.$$

$$\text{Funds Flow} = \text{Cash Flow} + \text{Current Accruals}.$$

Two samples were looked at: 193 US companies over an eighteen year period and 39 UK companies over a sixteen year period.

The relationship between the unexpected component of each of the three measures of accounting performance and contemporaneous abnormal stock price performance was analysed in two stages. The first stage examined the individual relationships between each of the measures of accounting performance and stock price performance. The second stage attempted to assess the incremental explanatory power of the accounting measures. The results of the first stage analysis showed a strong relationship for measures of unexpected income and a progressively weaker relationship for measures of unexpected funds flows and unexpected cash flows. The results of the second stage showed that the unexpected income measure had the strongest and most consistent incremental explanatory power relative to the other variables, followed by the unexpected funds flow measure. Unexpected cash flow had no incremental explanatory power.

There are two main limitations of this study, both of which are prevalent, if not inherent, in studies of incremental information content. The first limitation is that it is impossible to determine whether the lack of individual and incremental explanatory power is due to lack of power of the statistical tests or to lack of an underlying economic relationship. A closely related problem is that differences in power due to differences in sample sizes may account for much of the observed difference between the US and UK samples. If all else was held constant, the UK t-statistics would be expected to be deflated by approximately 0.45 (the square root of 39/193). Application of this deflation factor to the t-statistics for the US companies yields a pattern of significant t-statistics similar to that reported for the UK. The second limitation is that the assessed information content is conditional on the structure of the model used to relate the information variables to security returns. In this study, as in previous studies, the model assumes a simple linear additive relationship between measures of the unexpected component of the information variable and security returns. To the extent that this structure oversimplifies the underlying relationship, the empirical conclusions understate the information content. It remains for future studies to address both limitations through improvements in research design.

University of Washington David Burgstahler

Off-Balance Sheet Financing. *K. V. Peasnell and R. A. Yaansah.* The Chartered Association of Certified Accountants, 1988. 40 pp. £9.95.

One of the tantalising aspects of off-balance sheet finance (OBSF) is that by definition it is something unseen to the conventional gaze on the face of a balance sheet. It might be detected by a connoisseur of convoluted notes to the balance sheet but in all probability it will never pass beyond the ken of the board of directors, the bank which devised the scheme and the company's auditor. Concern about the growth of OBSF was a matter which initially derived from comments by auditors who were finding that the letter of the Companies Act, backed by the opinion of lawyers, carried more weight than attempts to present a true and fair view.

It is against this background of professional concern that academic interest in OBSF has emerged. The report by Peasnell and Yaansah is an extremely useful review of the issues which must be faced in this area by those who seek to regain the accounting initiative in determining what constitutes a true and fair view. The research report was published shortly after the ASC had issued the exposure draft ED 42, 'Accounting for Special Purpose Transactions', but before the comments on ED 42 were available.

The research report provides an outline of the nature of off-balance sheet schemes, emphasising aspects of principle such as control and recourse. One of the problems of off-balance sheet arrangements is that, while they appear to have effectively eliminated all chance of recourse on the liability, the enterprise retains effective control of the asset, or of the cash flow emanating from the asset. The report then moves on to analysing potential motives for undertaking such schemes. Misinformation and signalling are analysed in the context of capital market theory. The potential financial benefits, including enhancement of borrowing power, risk sharing, income management and tax management are explored. Because ED 42 assumes that users of accounting information are largely misled by current methods of OBSF disclosure, the report examines market rationality. It concludes with a chapter on financial reporting issues.

This is not a report of empirical findings but rather a preliminary review of the areas for investigation. The authors explain that the report is the first stage of a three-year project to investigate OBSF. The exploratory research at the first stage included a search of the relevant literature in the UK and USA, an examination of the financial statements of 100 companies to find what kind of disclosures exist, a statistical analysis of financial ratios using DATASTREAM in an attempt to discover companies which might have motives for using OBSF, and exploratory interviews in the City with individuals having particular expertise in this area of corporate finance.

It is slightly disappointing that details of the outcome of this research are not published in the report. Although the report provides an excellent review for those coming fresh to the subject area, it does not add greatly to existing knowledge of the subject matter or the problems. The list of references at the end of the report is very selective, omitting contributions from the UK accountancy profession such as those of Ian Brindle in *Financial Reporting* 1985–86 and 1986–87, and of David Tweedie and John Kellas in the April 1987 issue of *Accountancy*. The Report recommends supplementary disclosure but does not cite any instances of effective supplementary disclosure in the sample of financial statements reviewed, although it names one company which provides extensive but almost incomprehensible supplementary disclosure.

Probably one of the most useful recommendations made by the report is that proportional consolidation should be used in a situation where an enterprise has partial control of an asset but does not stand any risk of recourse on the related liability. It is unfortunate that the Companies Act 1989 did not take up this proposal, other than in respect of non-incorporated entities. As the report points out, lack of recourse is not a valid excuse for failing to consolidate a subsidiary which meets the legal definitions, while the concept of control has long been a central principle underlying group accounting. The Companies Act 1989 went some way towards extending the concept of control in relation to defining a subsidiary but, as the DTI acknowledged during the development of that Act, there will still be a need for the accounting profession to assist in the interpretation of control.

The Report is a useful review of the debate on OBSF and well worth recommending to anyone who is looking for an introduction to the range of issues where academic research should be capable of contributing to the solution of a significant practical accounting problem.

University of Glasgow Pauline Weetman

Evidence in Performance Auditing. *Muhammad Akram Khan.* Directorate-General of Research and Development, Department of the Auditor-General, Pakistan. 50 pp.

This brief monograph is by the Director-General of Research and Development in the Pakistani Auditor-General's Department. The author sets out for two reasons to extend financial auditing methodology to performance auditing. Firstly, he states that the financial audit methodology has been tried over a long period and one can safely rely upon it. Secondly, he maintains that there is a realisation among practitioners that the two approaches should converge and lead to a unified approach. The first of these reasons, in particular, is questionable. Even if the financial audit methodology can safely be relied upon for a financial audit, it surely does not necessarily follow that it can be relied upon for a performance audit. There is a research question here: can a financial audit methodology safely be extended to performance auditing? The author tends to assume that it can and gives some indications of where and how. However, there is no rigorous examination. Thus although the monograph gives some useful examples of applying (financial) audit ideas in a performance audit setting, the reader is not necessarily presented with an overall audit methodology which is demonstrably able to cope with all the needs of both financial and performance auditing.

The great strength of the monograph is its clear and well presented discussion of the financial audit methodology with particular attention paid to the use of monetary unit sampling. Its great weakness is a lack of a comprehensive discussion of the current methodology of performance auditing. There is clearly an opportunity for further research in this area, mapping performance audit methodologies currently practised against the better known financial audit methodologies. In addition, however, one needs to consider the comparative success of the two methodologies in meeting their respective objectives. A high degree of similarity may simply reflect that performance auditors are still unnecessarily and inappropriately rooted in traditional financial auditing methodology. If such a problem exists then it is likely to be accentuated by this publication.

In conclusion, the monograph provides a readable introduction to audit evidence issues in a setting which at least embraces performance auditing issues. The emphasis is on substantive testing with perhaps too much emphasis on sampling issues at the expense of internal control evaluation and analytical review. Computerisation is not explicitly discussed. The monograph does not convincingly demonstrate that the financial and performance audit methodologies either do or do not (should or should not) converge. This remains an interesting research question.

University of Edinburgh D. J. Hatherly

Staffing and the Smaller Firm. *M. J. Page, B. E. Elliot and N. S. Bristow.* Institute of Chartered Accountants in England and Wales, 1989. 88 pp. £10.00

Small businesses often look in the first instance to their accountant for general commercial advice. Given the importance of the small business sector and that 60% of small companies employ firms of accountants with less than five partners, the continued survival of small firms is pertinent to more than just small-firm practitioners. This research report found that the most important constraints on the profitability and growth of small accounting practices were perceived to be the cost and non-availability of qualified staff and suitable students.

The report has been prepared for the Research Board of the ICAEW and is based upon a two-part research project carried out in 1985. It is regrettable that publication has been so delayed but the findings are, in general, still applicable. The booklet comprises twelve pages of Introduction and Summary written by all three authors followed by chapter 2, the 'Results from the postal questionnaire survey' by Page, and chapter 3, 'Interviews with practitioners in smaller firms' by Elliot and Bristow. Both the questionnaire and interview sections contain appendices.

The two research approaches, which were conducted simultaneously, were used in order to give a greater depth of understanding. In the event their findings were mutually reinforcing and perhaps the publication would have profited from some judicious editing. A general representative picture is provided by the 88 responses to the questionnaire sent to 340 firms (selected from the English Institute's Members' List) with twenty or less partners; part-timers and sole-practitioners with no staff were excluded.

The greatest problem these firms face is the scarcity and cost of qualified staff. Of those that had tried over the preceding three years to recruit a qualified accountant only two thirds had succeeded. The problem is caused by a national shortage, by high salaries paid by competing employers and by a shortage of 'qualifieds' with appropriate experience for general practice firms; accountants trained with large firms are seen to be too specialised. While the small-firm practitioners appear to prefer to employ accountants that have qualified within the small-firm sector, the supply of such staff is restricted by the cost of training students and by the level and content of the Institute's exams.

There is also a severe problem in attracting suitable students. Interestingly, firms believe that chartered students contribute less to their profitability than other students. Firms that did not train chartered students were prevented from doing so by the cost of training, the disruption of study leave and the pressure of work. In contrast to larger firms, graduates and non-graduate students were equally popular. AAT (Accounting Technician) students were particularly highly rated and were seen to give better value up to senior level with responsibility for smaller clients and supervising juniors.

The report summarises the views of practitioners about how the ICAEW should assist smaller firms with their staffing. Small-practice work is seen to provide greater job satisfaction arising out of: closer contact with clients, greater breadth of experience, a more pleasant life-style, and more potential for advancement. As individual firms do not have sufficient resources, it was felt that there is a role for the Institute to publicise these advantages both within and outside the profession. Secondly, the respondents were anxious that training schemes should be arranged so as to minimise the disruption caused by study leave. Thirdly, the Institute should provide a subsidised recruitment service for smaller firms. Finally, it was recognised that consortia for training and other purposes were becoming increasingly popular and the Institute could help firms by providing some form of 'marriage broking' service.

Some of these suggestions have been implemented since 1985. A forum for group training schemes has been founded, an internal report has been commissioned by the Recruitment Trends Study Group, and the Institute has expanded its recruitment and training advice to smaller firms.

The research does not contain any startling revelations and has not set out to assist small firms with specific advice and its usefulness on bookshelves is limited accordingly. The questionnaire provides wide coverage and the findings are clearly valid. The impression given by the statistical interpretation of the interview responses could, however, be misleading. The responses are obtained from a sample that does not necessarily represent the population of small firms. Interviews are most useful in identifying issues and providing what is known as a 'rich picture' from informal evidence and attitudes such as 'The level of entry to the profession... does not relate to [that] required to carry out the work but to the ability to pass the examinations which have become far too academic'.

This is a useful piece of research which tends to confirm widespread attitudes about the problems of staffing a small practice.

R. G. Luther University of Exeter

ANNOUNCEMENT AND CALL FOR PAPERS

European Accounting Association Annual Congress

Maastricht, The Netherlands, April 10–12, 1991

Submission of research papers is invited for inclusion in the programme of the 1991 Annual Congress of the European Accounting Association in Maastricht, The Netherlands. Papers on all subject areas within accounting are welcome.

Papers, in English, should be sent in triplicate not later than *December 5, 1990* to:

Professor Hein Schreuder
c/o Mrs. Ilse Gronenschild, congress secretary
Faculty of Economics and Business Administration
University of Limburg
P.O. Box 616
6200 MD Maastricht
The Netherlands
Fax: 31/43/210999

A full text of the Call for Papers, with detailed submission guidelines, and further information about the congress, can be obtained at the same address.

Financial Accountability & Management

Spring 1990 *Editor: John Perrin* *Vol. 6 No. 1*

Contents

Public Sector Accounting in Japan Mainly Related to Municipality
by HIROSHI YOSHIDA

Physicians and Resource Management in Hospitals: An Empirical Invesigation
by MARGARET A. ABERNETHY AND JOHANNES U. STOELWINDER

Which Internal Market? The NHS White Paper and Internal Markets
by PENELOPE M. MULLEN

External Reporting by UK Universities: An Exploratory Study of Accounting Change
by ROB GRAY AND JIM HASLAM

Subscriptions

			1990 volume	
	UK only	Europe	Rest of the World	North America
Institutions, libraries and professional	£39.00	£46.00	£49.00	$81.50
Teachers and students	£17.00	£19.50	£21.00	$35.00

Journal of Business Finance & Accounting and *Financial Accountability & Management* (combined rate)

Institutions, libraries and professional	£83.50	£90.00	£100.00	$166.00
Teachers or students	£38.50	£44.00	£46.50	$77.00

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford, OX4 1JF, UK. Editorial communications to *Financial Accountability & Management*, Department of Economics, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, England.

NATIONAL UNIVERSITY OF SINGAPORE
DEPARTMENT OF FINANCE AND BANKING
LECTURERS/SENIOR LECTURERS/ASSOCIATE PROFESSORS

Applications are invited from candidates who are able to teach in one or more of the following areas at the BBA and MBA levels:

Theory of Finance
Management Control Systems
Financial Markets and Institutions
International Finance and Banking
Risk Management and Insurance

Applicants should possess a PhD degree from an accredited university. Those who expect to complete their doctoral programme soon may also apply. New PhD holders begin their career as Lecturers.

Besides appointments on normal 3-year contracts, visiting appointments for one to two years may be considered.

Gross annual emoluments range as follows:

Lecturer	S$50,390–64,200
Senior Lecturer	S$58,680–100,310
Associate Professor	S$88,650–122,870

(STG£1.00 = S$3.13 approximately)

The commencing salary will depend on the candidate's qualifications, experience and the level of appointment offered.

Leave and medical benefits will be provided. Depending on the type of contract offered, other benefits may include: provident fund benefits of an end-of-contract gratuity, a settling-in allowance of S$1,000 or S$2,000, subsidised housing at nominal rentals ranging from S$100 to S$216 p.m., education allowance for up to three children subject to a maximum of S$10,000 per annum per child, passage assistance and baggage allowance for the transportation of personal effects to Singapore. Staff members may undertake consultation work, subject to the approval of the University, and retain consultation fees up to a maximum of 60% of their gross annual emoluments in a calendar year.

The Department of Finance and Banking is a department in the Faculty of Business Administration. There are 8 faculties in the National University of Singapore with a current student enrolment of some 14,000. All departments are well-equipped with a wide range of facilities for teaching and research.

All academic staff have access to the following computer and telecommunication resources: an individual microcomputer (an IBM AT-compatible or Apple Macintosh); an IBM mainframe computer with 16 MIPS of computing power; an NEC SX supercomputer with 650 MFLOPS of computing power; departmental laser printers; a wide spectrum of mainframe and microcomputer software; voice-mail; BITNET to access academic institutions world-wide. In addition, a proposed campus network based on state-of-the-art optical fibre technology will be installed by end of 1990 to facilitate resource sharing and electronic communication for the academic community. An on-line library catalogue will also be accessible by the middle of 1990.

Application forms and further information on terms and conditions of service may be obtained from:

The Director
Personnel Department
National University of Singapore
10 Kent Ridge Crescent
Singapore 0511

NUS Overseas Office
Singapore High Commission in London
5 Chesham Street
London SW1
U.K.
Tel: (071) 235-4562

Enquiries may also be sent through BITNET to: PERTLS @ NUS3090, or through Telefax: (65) 7783948.

Accounting and Business Research

Accounting and Business Research

Editors:
R. H. Parker, University of Exeter
C. W. Nobes, University of Reading

Board of Editorial Referees
J. Arnold, University of Manchester
P. W. Bell, Boston University
A. M. Bourn, University of Southampton
M. Bromwich, London School of Economics
P. Brown, University of Western Australia
D. A. Burgstahler, University of Washington
D. J. Cooper, University of Alberta
D. A. Egginton, University of Bristol
M. Firth, University of Colorado at Denver
J. Flower, Commission of the European Communities
T. A. Lee, University of Edinburgh
R. Ma, Brisbane
G. B. Mitchell
D. T. Otley, University of Lancaster
J. M. Renshall, KPMG Peat Marwick McLintock
L. Revsine, Northwestern University
J. M. Samuels, University of Birmingham
D. Simunic, University of British Columbia
L. C. L. Skerratt, University of Manchester
D. Solomons, University of Pennsylvania
C. R. Tomkins, University of Bath
D. P. Tweedie, Accounting Standards Board and University of Bristol
M. Walker, University of Manchester
G. Whittred, Australian Graduate School of Management
B. S. Yamey, London School of Economics
S. A. Zeff, Rice University

Editorial Office:
R. H. Parker, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK. Tel: 0392 263209.
Fax: 0392 263305

Advertisement and Subscription Office:
40 Bernard Street, London WC1N 1LD, UK. Tel: 071 628 7060

The Institute of Chartered Accountants in England and Wales
Incorporated by Royal Charter, 11 May 1880

Institute Offices and Library:
Chartered Accountants' Hall, Moorgate Place, London EC24 6EQ. Tel: 071 628 7060

The views expressed in *Accounting and Business Research* are not necessarily shared by the Council of the Institute of Chartered Accountants in England and Wales. Articles in *Accounting and Business Research* are published without responsibility on the part of publishers or authors for loss occasioned to any person acting or refraining from action as a result of any view expressed therein.

© 1990 The Institute of Chartered Accountants in England and Wales.

ISSN 0001-4788

65
AC27

Accounting and Business Research
Volume 21 Number 81 Winter 1990

Contents

The Management of Foreign Exchange Risk in UK Multinationals: An Empirical Investigation	P. A. Belk Martin Glaum	3
The Origin of General Limited Liability in the United Kingdom	E. A. French	15
Determining Meaningful Sales Relational (Mix) Variances	Brian Gibson	35
Intangible Marketing Assets. A Managerial Accounting Perspective	C. Guilding R. Pike	41
The Pricing of Initial Offerings of Privatised Companies on the London Stock Exchange	Kojo Menyah Krishna N. Paudyal Charles G. Inyangete	51
Further Evidence on Accounting Choices: The South of Scotland Electricity Board, 1978–1988	W. M. McInnes	57
Human Information Processing and the Consistency of Audit Risk Judgments	Jerry R. Strawser	67
An Induced Theory of Financial Ratios	Mark Tippett	77
Financial Reporting: Current Problems and Their Implications for Systematic Reform	D. P. Tweedie G. Whittington	87
Book Reviews		103

Bound Volumes of Accounting and Business Research

Bound volumes with index of Volume 8 1977–78 onwards are available from the Subscriptions Manager, Accounting and Business Research, 40 Bernard Street, London EC1N 1LD, England.
Subscribers wishing to have their own copies bound should address their enquiries to Messrs. George Woodhead and Co., 1 Gloucester Street, Manchester M1 5GP, England.
Microfilmed copies of back numbers are available from Microfilm Ltd., East Ardsley, Wakefield, West Yorkshire WF3 2AT, England.

Subscription Rates

	UK	Overseas	Overseas Airmail
Individual	£23	£25	£30
Student	£12	£13	£18
Corporate/institutional	£34	£35	£40

All Subscriptions may be paid in US dollars at current rates of exchange.

Forthcoming Articles

A. J. Arnold, Secret Reserves or Special Credits? A Reappraisal of the Reserve and Provision Accounting Policies of the Royal Mail Steam Packet Company, 1915–1927.

R. H. Berry and S. Nix, Regression Analysis vs. Ratios in the Cross Section Analysis of Financial Statements.

P. R. Draper, W. M. McInnes and A. Marshall, Accounting for Convertible Loan Stock. A Decomposition Approach.

O. Finley Graves, Fritz Schmidt, Henry Sweeney and Stabilised Accounting.

Scott Holmes, Pam Kent and Glenn Downey, The Australian Differential Reporting Debate: A Survey of Practitioners.

Gary Kelly and Mark Tippett, Economic and Accounting Rates of Return: Statistical and Empirical Analysis.

M. Kerremans, H. Theunisse, G. van Overloop, Impact of Automation on Cost Accounting.

John E. McEnroe, Attitudes Towards the Term 'Generally Accepted Accounting Principles'.

Christopher J. Napier, Aristocratic Accounting: The Bute Estate in Glamorgan, 1814–1880.

Walter Taplin Prize

The British Accounting Association and Accounting and Business Research offer a prize of £100 for the best article published in each annual volume. The prize is named in honour of the journal's founding editor, the late Walter Taplin. The prize relating to Volume 19 (1989/89) was awarded to Don Egginton, John Forker and Mark Tippett for their paper on 'Share Option Rewards and Managerial Performance: An Abnormal Performance Index Model' which was published in the Summer 1989 issue.

Reproduction Policy

Permission is hereby granted to reproduce without charge any article in this issue of Accounting and Business Research for use in courses of instruction provided that the source and the author's copyright are indicated in such reproduction.

Objective of Accounting and Business Research

The objective of Accounting and Business Research is the publication of substantial and original contributions to knowledge in the areas of accounting and finance, broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

Accounting and Business Research, Vol. 21, No. 81, pp. 3–13, 1990

The Management of Foreign Exchange Risk in UK Multinationals: An Empirical Investigation

P. A. Belk and M. Glaum*

Abstract—This paper reports the results of an empirical study undertaken during 1988 into how UK multinational corporations try to manage their foreign exchange exposures. The paper concludes, with reservations due to the limited nature of the study, that accounting exposure was managed actively by the majority of respondents, that transaction exposure management was seen as the centrepiece of their foreign exchange risk management, and that the management of economic exposure was subject to very heterogeneous practices. Further, the surveyed MNCs showed a lower degree of centralisation than could have been expected on the basis of the relevant literature, and the majority of respondents described their companies as 'totally risk averse'.

Introduction

This paper reports the results of an empirical study into the current practices of UK multinational corporations (MNCs) in the area of foreign exchange risk management. Over the last ten to fifteen years significant changes have taken place in national and international financial markets. On the one hand, the financial environment has become more volatile and uncertain. On the other, a whole range of new, innovative financial products has been supplied by the markets to help companies cope with the increased risks. The present study seeks to ascertain how UK MNCs manage their foreign exchange risks in the light of the above described developments. The paper looks at the way MNCs try to manage their foreign exchange exposures: that is, which concepts they use, what objectives they follow and how they have organised this important function of multinational financial management.

Methodology of study

The study presented here is based upon research conducted in 17 major UK industrial companies during 1988. These companies were selected because of their significant degree of international involvement. Personal interviews were conducted with senior financial managers (normally treasurers) who were asked about their companies' foreign exchange risk management. Each interview was based on the same predetermined structure of open-ended questions. The interviews were supplemented by five interviews with managers working with financial innovations in banks, and by one interview with the Bank of England. The paper is an analysis of recordings and notes taken during and after the research interviews. Word by word quotes are given where appropriate. They have been edited only as much as necessary to prevent the identification of interviewees or companies. No real company names are given, and a company named Company A in one section will not necessarily be the Company A of another section.

The interpretation of the results of the study is subject to limitations imposed by the scale of the study and the research method used. First, the study uses a sample of 17 companies and therefore does not claim to be a representative study of UK MNCs. The second limitation results from the use of the technique of personal interviews based on a predetermined structure of open-ended questions, which was chosen because, with the non-quantitative nature of the study, it seemed the only appropriate method to produce the wide-ranging and intuitive answers and personal opinions aimed for. The use of personal interviews also reduces the risk of misunderstandings and other factors which may lead to useless results in the case of alternative methods (e.g. postal questionnaires). However, in personal interviews the interviewer may exert a bias on the answers. The researcher must try to avoid this as much as possible by careful preparation. Also, the answers of the individuals interviewed are naturally subjective and need not always be identical with the attitudes and policies of the respective company. Finally, given the research methodology chosen, the analysis was undertaken without the benefit of an explicit conceptual framework. This inevitably creates problems when attempting to explain the findings. Undoubtedly the development of such a conceptual framework is an area worthy of further consideration by all involved in research in the area of foreign exchange risk management.

---

*The authors are, respectively, lecturer in finance and accounting at Loughborough University of Technology and doctoral student at Justus-Liebig University, Giessen, Germany.

Scope of research

The following five issues are of concern in this paper:

(i) accounting exposure management;
(ii) transaction exposure management;
(iii) economic exposure management;
(iv) the organisation of the companies' foreign exchange risk management; and
(v) the objectives of such management.

These will be dealt with in turn in this section.

Accounting Exposure Management

The study produced some interesting and surprising results on the management of accounting (translation or balance sheet) exposure in UK MNCs. For some 15 years the literature on international financial management has been demonstrating that accounting exposure is not a useful concept as a basis for corporate foreign exchange risk management (see, for instance, Buckley, 1986). Accounting exposure does not give a true picture of the effects of exchange rate changes on the economic value of the firm, and the gains and losses measured are purely of a paper nature (see Cornell & Shapiro, 1983). It has been suggested (see, for instance, Cornell & Shapiro, 1983)—and a comparison of two studies by Rodriguez (1981) seemed to confirm this—that MNCs have been changing their approach over recent years, away from a focus on accounting exposure towards an emphasis on the management of cash flow exposures.

Against this background it was surprising to find that UK MNCs were still very much concerned about their accounting exposures. Of 16 respondent companies, only three considered it to be without relevance. They explained that they simply accepted it as a result of doing business and would not consider influencing or managing it. The most outspoken example of this attitude was the following:

> *Company A:*
> Translation risk I can't honestly say we take at all seriously. We certainly do not manage it. We cover our dividends, but that is transactions —real money transferred from one country to another. But with translation exposures, nothing happens.

Thirteen companies out of 16 respondents replied that they considered accounting exposure to be of importance. Of these, two influenced their exposures through the gearing of their overseas subsidiaries but would not attempt to hedge the remaining net asset exposure.

> *Company B:*
> We do not hedge our net equity exposure, but we influence it through our gearing. For instance, it does not make sense to have a high gearing in a Swiss subsidiary.

This leaves 11 companies which were prepared to manage their net accounting exposures actively. In all cases this meant the parent company borrowing in the currencies of the net asset exposures of their subsidiaries. Five of these had explicit policies as to the management of their accounting exposures. One company claimed to hedge completely its accounting exposures. Three companies sought to hedge their exposures, but they also considered the cost of borrowing in foreign currencies and expected exchange rate changes. The objective of hedging the balance sheet was here clearly mixed with speculative motives. The fifth company also hedged its net foreign assets; it was, however, concerned about the effects that future exchange rate changes could have on its overall debt-equity ratio if it borrowed heavily in foreign currencies.

> *Company C:*
> Yes, we take our net asset values and hedge them with foreign borrowings. Our translation risk is managed and hedged 100%.

> *Company D:*
> As far as our overseas assets are concerned, we have what we call a 'managed matched situation'. In other words, we try to match our assets in the US with US-dollar liabilities to protect our balance sheet. And we manage it. On certain occasions, say, if the dollar is strong, we will reduce our liabilities in dollars, if it is weak we will increase them. By and large, we are looking for a matched situation. We are not 100% matched at the moment, but matching is pretty good.

> *Company E:*
> Yes, we do monitor our accounting exposure. We measure it and we manage it by means of borrowings in currencies of net exposures. However, we are very concerned about not losing control of our gearing, and we therefore aim for what we call a 'constant currency gearing'.

The other six of the 11 companies reported that they did not continuously manage their accounting exposures. They closely monitored them and would take action, i.e. borrow in the respective foreign currencies, under certain circumstances.

Most companies appeared to be in close contact with analysts, brokers and banks about this matter. Other important considerations for whether and when to hedge their accounting exposures were interest rate differentials, tax factors, the group's overall gearing and expectations about future exchange rate movements. On the whole, the degree to which 'views' on future exchange rates determined the companies' borrowing and hedging decisions was surprisingly high.

Transaction Exposure Management

For 14 of the 17 companies interviewed, the day-to-day management of transaction exposures was the centrepiece of their foreign exchange risk management. Two companies declared that for them transaction exposure management was of minor importance and that balance sheet exposures were relatively more important.

One company—and only one—was of the opinion that there was no point at all in attempting to manage transaction exposures. This company was concerned about the longer term influences of exchange rate changes on its business. It had in fact developed an approach to manage its economic exposures with financial instruments. However, it perceived foreign exchange markets to be efficient enough to render futile any attempt to gain by managing transaction exposures.

> *Company A:*
> In managing transaction exposure the only thing that matters is to be consistent. If you sell forward all the time or not at all, this is going to make very little difference. But if you sell forward until you see 'Oh, we're making losses', the chances are that each time you change it will be just before the turn of the cycle. Then you lose more than you gain. So all we like to see in our companies is consistency. At the parent company most of the funds flow is dividends, and if we bring the funds out of the country at all we take the rate of the day. We don't try to be covered.

As to the 16 MNCs that did manage their transaction exposures (including those for which this was of minor importance), their approaches were found to be very diverse, spanning the whole spectrum from hedging all exposures to large scale trading in foreign currencies. Six companies explained that it was their policy to hedge all their transaction exposures completely. Two of this group of companies hedged every exposure immediately it arose. The others seemed to allow themselves some flexibility as to the timing of their taking cover.

> *Company B:*
> As soon as the transaction exposures are incurred we hedge them 100%. We run a very square book.

Another group of six MNCs responded that they generally tended to hedge their transaction exposures but allowed themselves the discretion of leaving proportions uncovered at times. Within four of these companies the proportions appeared to be very small in relation to the size of the overall exposures managed.

> *Company C:*
> Very small transactions we wouldn't cover, i.e. below $5000 we would consider the risk involved would not justify the cost involved of going to the market.

> *Company D:*
> Sometimes our dealers do take positions, but this is minute. They are allowed a maximum of £20,000 equivalent in six currencies, but not more than £60,000 in total.

The other two companies had a rule of always covering a minimum of their transaction exposures of 60% and 75% respectively. Whether to go beyond the limit imposed by top management or whether to leave the remaining proportion open was up to the discretion of the treasury management.

The remaining four of the 17 MNCs surveyed were involved in foreign exchange dealing to a greater extent. However, two of these remaining four asserted that their positions were limited by the exposures incurred through their basic business. That is, they would not sell a currency they were already short of, or buy it if they already had a long position.

> *Company E:*
> As to the transaction exposures arising in the centre, we take a selective approach. However, we are only involved in the foreign exchange markets with activities that are associated with our operating cash flows. We do not trade in foreign exchange.

> *Company F:*
> Views are being taken on short-term movements of currencies. Sometimes we hedge 100%, sometimes 0%, traditionally we hedge around 70%. However, we never have greater open positions than our basic, operational exposures.

Only two companies appeared to be engaged in trading in foreign exchange beyond that limit. In their opinion, foreign currencies were a commodity they dealt in for profit as with any other commodity. To the visitor, the treasury departments of these two companies looked exactly like the dealing rooms of smaller or medium sized banks, and this attitude was also reflected in the answers received during the interviews.

> *Company G:*
> We take a selective approach. We do not directly cover. Our operational transaction ex-

> posures are integrated into our daily trading. We are quite actively engaged in short and medium term trading in foreign exchange and money markets.
>
> *Company H:*
> The actual transactions coming from our operating units we simply take on our books as part of the actual trading. We trade in foreign exchange, but we do not quote into the market. We take the quotes given to us by the banks. We do not trade on spreads. Basically we work like a small bank. There are trading limits for all the banks, and we try to make money on small short to medium term movements of the markets.

The four MNCs involved in foreign exchange dealing belonged to the largest companies in the sample. This seemed to indicate a certain correlation between the absolute size of an MNC and its propensity to take risks in the foreign exchange markets. However, neither within the group of four nor with the remaining companies was it possible to identify a more specific relationship between the two variables. At the same time the small sample size forbade the use of statistical techniques to arrive at any further statements on such a function.

A final point is that with some MNCs the management of transaction exposures had been the subject of changes over recent years. These were often directly connected with personnel changes in the treasuries of the companies, but they also appeared to be the effects of learning processes—in some cases quite clearly processes of learning by trial and error.

> *Company A:*
> Up to the mid-70s we had 100% discretion in our transaction exposure management. We then got advice and forecasts from a bank and either left 100% uncovered or covered 100%. However, we mostly got it wrong; often two or three times wrong because of stop-loss decisions. We consistently made losses on this policy, and therefore we changed our policy.

Economic Exposure Management

In the literature it is well established today that the concept of economic exposure is the most appropriate concept to be used as a basis for corporate exchange risk management. By taking into account the competitive situation of the company, the concept makes evident what effects exchange rate changes can have on its costs and revenues. The economic exposure concept focuses on future cash flows, and therefore it is consistent with the goal of maximising the long-term economic value of the firm (see, for instance, Walker, 1978; Wihlborg, 1980; Flood & Lessard, 1986; Shapiro, 1989).

Because of the complex nature of the topic and the great diversity of the companies interviewed, it is not surprising that the questions about the management of economic exposure and the longer term, strategic aspects of foreign exchange risk management produced very heterogeneous results. Some of the questions met with only hesitant replies, and at times the use of the term 'economic exposure' seemed even to evoke a feeling of uncertainty and unease with the interview partners. The following gives a good instance of this.

> *Company A:*
> We do think about our economic exposures a lot, but it is difficult to say exactly what we do.

Again 16 companies replied to the questions. Of these, six companies did not make any attempt to forecast and analyse their future cash flows in order to manage their economic exposure. Only incurred and reported transaction exposures formed the basis of their exposure management. Ten companies based their foreign exchange risk management on cash flow forecasts, but the degrees of sophistication and the time horizons used for such forecasts varied greatly. For four companies, forecasting was limited to the supply of information on expected foreign currency denominated orders. Three other companies followed a system whereby they always bought and sold forward the estimated foreign currency outflows and inflows of the next planning period. The planning horizon for this practice varied from one to twelve months. One company, for example, would buy forward throughout 1988 the foreign currency revenues it expected to receive during 1989. This was done on the basis of a budget which had been concluded in August 1987 and had not been revised since. Two companies used more highly developed cash flow forecasting systems. One produced a monthly group-wide net exposure forecast for the coming 12 months. The other attempted a comprehensive forecast of its cost and revenues over the overall lifetime of its operations; this forecasting system had a time horizon of five years, but in some aspects it went out even further than that.

All of the above nine companies had the management of their expected future cash flows closely interlinked with the management of actual transaction exposures. In contrast, the tenth company using forecasts did not engage in managing transaction exposure at all (see preceding section). However, it did use a sophisticated system of matching the currency denomination and maturities of its debt to the cash flows it expected to receive from its operations abroad. The same company was also one of three companies within the sample found to employ a highly sophisticated technique—a form of regression analysis—which determined their real as opposed to their nominal exposure. To give an example, a UK-based company may export a product to the US. On the surface it thus appears to have a US-dollar exposure. However, its major competitors may be German, and the international dollar price will for this reason follow the pattern of the deutschmark/dollar rate. Effectively the company receiving dollars therefore faces a deutschmark exposure. To generalise, the world prices of certain products are markedly influenced by the basket of currencies of the major market participants (see Lighterness, 1987). The following quotes come from two companies using the technique, one of which is again Company A.

> *Company A:*
> Basically the movement of the price of one of our products consists of two components: the price of the product itself and the basket of currencies of the consuming countries. Our department dealing with this product holds that they are quite capable of managing the product element of the price, but they can't deal with the vagaries of the foreign exchange markets. But then we came along with a product which effectively did just that. We give them an option over the foreign currency side of the product price in return for a premium which they regard as entirely satisfactory.

> *Company B:*
> Just recently we have found the correlation between the price of one of our main products and exchange rates. It is a very complicated formula and we have been looking for it for four and a half years.

One of the most significant results of the questions on economic exposure was that none of the companies interviewed used any means of managing exchange risk other than financial means. Modern literature on exchange risk management holds that the 'major burden of exchange risk management must fall on the shoulders of marketing and production excecutives' (Cornell & Shapiro, 1983; also see Stonehill, Ravn & Dullum, 1982; Shapiro, 1989). The practice of UK MNCs does not comply with this. Only three companies responded that exchange rate considerations played a role at all in non-financial decision making areas (e.g. sourcing, product development or production location), but even with these companies the role was only minor.

> *Company C:*
> Exchange risk influences strategic decisions only in a minor way. Hedging may be a nice by-product of a decision but it is not an initial decision factor, not decisive.

In general, foreign exchange rates and foreign exchange risk were not seen as strategic factors. Although most respondents gave reasons for this, a number of companies appeared not to be aware of the important longer term effects of exchange rate changes and the risks involved. Others were aware of these longer term implications but did not know what to do about them. Two reasons were given most often for not attaching more importance to the problems of the strategic management of foreign exchange risk: the companies either did not feel very susceptible to the longer term economic effects of exchange rate changes or they felt committed to their particular business which did not allow them any flexibility in matters such as sourcing, location of production facilities, etc.

A further interesting observation made during the interviews was that in some companies decisions on whether and with what means to hedge their exposures were strongly influenced by what their competitors did (or, rather, what the companies thought their competitors did). This factor was explicitly mentioned by managers from three MNCs. They explained that, in certain circumstances, and in particular with respect to expected future exposures, their hedging decision is not based on considerations such as risk and return, the efficiency of exchange markets or the protection of the company's cash flows. These considerations are often cited in the literature but this sees the decision making company in isolation. Instead some companies are more concerned about their relative market position. This is more important in duopolistic or oligopolistic markets, when it can be crucial whether competitors experience unfavourable or favourable exchange rate changes.

This interesting point has so far been largely ignored in the literature on hedging and hedging instruments. It is however very much consistent with the concept of economic exposure which claims to focus on the competitive situation of the company. One has to bear in mind also that a high proportion of today's internationalised markets are oligopolistic.

> *Company D:*
> You have to look at the competition. If you are not sure what the competition does, then you use options. If you cover your cash flows over longer periods with forward and your competitors don't, and the exchange rate moves in their favour, you have in fact created an economic exposure.

> *Company E:*
> Foreign exchange risk management is subtler than just taking 100% forward cover. It is necessary to be aware of what the competition is doing. To give an example, one of our companies exports to the USA and its main competitor is UK-based too. Now it seems to me that the subtle and intelligent way of coping with that is to consider using quite a lot of options. Because,

> if the exchange rate moves in your favour, you can take advantage of it in the same way as your competitor does. If the exchange rate moves against you, your uncovered competitor gets hammered and you don't. But if the rate moves against you and you've got forward contracts, you're locked in.
> Question: How do you know what your competitor does?
> Answer: I'm really not prepared to answer that—I am not talking about anything devious. People pick up bits and pieces. And in any case you don't have to know what your competitor does, you just have to think what is your best position against a competitor that does cover or against one that does not cover.

The Organisation of the Exchange Risk Management

The study sought to ascertain to what degree and in what ways the MNCs had centralised their foreign exchange risk management, how policy decisions were derived and whether the treasuries were run as profit centres. The decision on the degree of centralisation of the treasury function is a crucial element in the financial strategy of any MNC (see, for instance, Mathur, 1982; Pausenberger & Voelker, 1985; Shapiro, 1989; Donaldson, 1987). After citing numerous such publications, Collier & Davis (1985, p. 328) conclude that: 'On this basis we may interpret the norm for the management of transactions risk exposure as requiring a degree of centralised control over both UK and overseas subsidiaries'.

In his 1982 study on the centralisation of the transaction exposure management of US MNCs, Mathur distinguished three degrees of centralisation:

(i) high: decision making and implementation of policies at group HQ;
(ii) low: decision making at HQ, implementation at operating units; and
(iii) decentralised: decision making and implementation at operating units (see, also, Pausenberger & Voelker, 1985).

Although the answers from the UK MNCs also concentrated mostly on transaction exposure management, Mathur's framework proved to be not wholly appropriate. The central treasuries of practically all the MNCs surveyed provided the services of an in-house bank to the subsidiaries of their group. For this reason, in UK MNCs the low degree of centralisation generally consisted of local decision making and central implementation (instead of central decision making and local implementation). In a few cases, however, the subsidiaries appeared to have a choice of whether to use the central treasury or an external (local) bank. To add to the complexity, in a number of companies the degrees of centralisation varied considerably between UK, European and other subsidiaries.

Allowing for these factors, the findings of the study are as follows. Of the 17 companies only one was found to have a completely decentralised exchange risk management function. Both decision making on and the implementation of exchange risk policies took place at subsidiary level.

> *Company A:*
> Our exposures are being dealt with locally. We could not really dictate to, say, an Australian company how they should be managing their transaction exposures. That is something we know about, but we leave it very much to the local management. We give them guidelines if they want them.

Seven companies showed a low degree of centralisation of their exchange risk management. In all cases this meant that the decisions on whether, when, and with what means to cover exposures were taken by the subsidiaries, while the parent company provided the required services. In most cases it seemed to be at least customary to use this service, but there were differences between UK and overseas subsidiaries.

> *Company B:*
> We have the relationships with the banks. We establish the dealing lines, we watch the cable and other rates and we give advice to our operations, to our general managers, and it is up to them to make the decision when to buy. When they tell us to buy we buy. We have an advisory role and we actually transact the business, but we don't make the decision here.

The exchange risk management of nine MNCs had a high degree of centralisation. Here firm rules existed for the subsidiaries to cover their exposures with the central treasury, which then managed them centrally. The companies with high proportions of intra-group trade centralised exposures by invoicing overseas units in their respective foreign currencies. Even with these highly centralised MNCs, overseas (e.g. US or Australian) subsidiaries sometimes were not fully integrated into the central treasury system.

> *Company C:*
> This is very centralised and very rigid for our European subsidiaries. Only the US companies are independent. At the moment of exposures arising, the subsidiaries are compelled to buy and sell their foreign currencies to or from the HQ.

An interesting point qualifying the distinct advantages experienced through centralisation was made by company D:

> *Company D:*
> Exchange rates are recognised at top level and there is great awareness of the risks. On an operational level, we find it a problem that the centralisation removes this awareness. For this purpose we have to go to our firms and inform and school our managers.

Given that 16 out of 17 MNCs had centralised their exchange risk management at least to some extent one could argue that the surveyed UK MNCs showed a high degree of centralisation. However with all companies, including the nine highly centralised ones, overseas subsidiaries were only partly included in the centralised system. Moreover, with seven of the 16, the decision making on hedging (transaction) exposures was found to be decentralised. These companies showed a much lower quality of centralisation compared to the companies in Mathur's study, which had centralised decision making and decentralised policy implementation. Through the provision of in-house bank services, all the MNC can achieve is the realisation of economies of scale in the actual exchange and money market dealings. Without centrally set rules applicable to all subsidiaries, the MNC will not be able to implement a rational and consistent exchange risk management strategy on a group-wide consolidated basis (see Ankrom, 1974). It will in particular be unable to utilise the full range of exchange risk management tools available (e.g. exposure netting, leading and lagging, pricing policies, utilising differences in national taxation systems etc.). It is therefore justifiable to conclude that the surveyed UK MNCs showed a lower degree of centralisation than could have been expected on the basis of the recommendations in the relevant literature.

Finally, the MNC managers were asked whether their treasuries were run as profit centres. Nine managers replied that it was not their prime objective to make profits; instead they characterised their treasuries as 'service centres' or 'negative cost centres' which tried to operate as efficiently as possible.

> *Company E:*
> We are a service centre which seeks to be profitable. As a company we are risk averse and we are prepared to pay the cost. The notion of the treasury as a profit or a cost centre can lead to dangerous decisions.

Six treasurers responded that their treasuries were not profit centres since they did not receive plan profits; they added that they were nonetheless expected to contribute profits.

> *Company F:*
> Strictly speaking our treasury is run as a cost centre, but certainly we are expected to make profits. We have a history of making profits, and therefore there also is some expectation that we will continue to do that.

Two of the 17 treasuries were actually run as profit centres. The treasurers were then asked to explain how it was possible to budget for profits in the area of foreign exchange management. To this question the following two answers were received:

> *Company G:*
> We have to do a business plan just as everyone else. These days it is expected, everyone is given a target. Even the dealing room of a bank is given a target. It is tough, because what you do know is roughly how much turnover you are going to get. But whether you are going to come out ahead or lose is very hard to say.

> *Company H:*
> That is a problem. I think we just put a nominal figure there. We just put £100,000 and hope for the best. On the other hand our foreign exchange manager knows approximately his turnover from our subsidiaries. He should know how much he can make from that, and how much funds he then has to manage in the markets.

These answers are interesting and revealing. Foreign exchange markets can be assumed to be so efficient as to make it impossible to predict with any degree of certainty whether a company will make a profit on any outstanding contract or for any particular period. This efficiency also means that the profits on past contracts or periods give no indication as to future results. The 'planning' of such profits is therefore necessarily arbitrary. The second of the quotes especially shows why it is nevertheless possible for a group treasury to achieve its profit targets. The central treasury acts as a broker between foreign exchange markets and the subsidiaries as they buy cover for their operational exposures. Since the subsidiaries are compelled to deal with the centre (one manager used the term 'captive customers'), the treasury can easily make a 'profit' by charging the subsidiaries less competitive rates than it can achieve itself in the markets. However, this difference in rates is only a real profit in as much as centralisation leads to economies of scale and the central treasury can achieve rates which are more competitive than those the subsidiaries could have got on their own. If the central treasury's profits exceed these centralisation gains, they are not real profits gained in the markets for the group as a whole, but merely a distortion of the internal distribution of the group's results among its different units.

The notion of running a treasury department as a profit centre is ill-conceived for a second reason. Suppose that a company receives net inflows of US dollars which it wants to convert into sterling. If the dollar depreciates continuously over a long period, the treasury of this company can at best break even by having covered the dollar inflow forward over the whole period. On the basis of the dollar inflow there is no possibility for it to make a profit. Alternatively, if the dollar appreciates, the treasury is certain to report a profit even if it does nothing but wait. The conclusion is that the efficiency of a treasury cannot be measured by means of a profit figure only. Furthermore, a concentration on profits alone ignores the second important parameter of operations in foreign exchange markets, namely the risks involved. Profits that can only be achieved with a 50% chance of the company going bankrupt are clearly not in the interest of all shareholders.

All this is not to say that the performance of a company's treasury department cannot be evaluated, or for that matter that a treasury department should not be encouraged to make profits. What it implies, however, is that such an evaluation is difficult, and that a single dimension is insufficient to produce meaningful judgements. Firstly, the results of a treasury have to be seen against the background of what it could possibly have achieved given the market situations. In other words, opportunity gains (or losses) become the benchmark for actual profits (see Cooper & Franks, 1987). (One company actually operated a highly sophisticated reporting system which measured its results in this way.) This is obviously a very tough benchmark, since any *ex post* evaluation has the benefit of perfect hindsight. Therefore, what has to be taken into account in judging the treasurer's decisions is the information available at the time.

Finally, an important determinant for the results of a treasury is the risk attitude of the company. A treasury that has guidelines compelling it to be risk averse and prudent in its operations cannot be judged as a treasury whose objective is to be aggressive and profit-orientated. A treasury should not be evaluated on the basis of a one-dimensional profit figure, but on the basis of how well it manages to achieve the company's multi-dimensional objectives in a dynamic environment.

Exchange Risk Management Objectives

During the interviews the treasurers were asked to state precisely the objective of their foreign exchange risk management. Sixteen answers were received. Nine treasurers described their companies as totally risk averse. Four said that, although they aimed to make profits on their exchange risk management and did not hedge all of their exposures, their approach could correctly be described as risk averse. Three characterised their companies' attitudes as 'risk taking' or 'risk seeking in relation to the additional return'. These answers are interesting for several reasons. First, as intended, they supply information as to the objectives pursued by the MNCs. The following selected quotes give an impression of the nature and diversity of the answers:

> We are totally risk averse. The objective is to minimise our financial risks.
>
> We are essentially risk averse but we have to be profit conscious as well. We regard finance as a resource to be maximised.
>
> The objective of the treasury is to enable the company to do what it does best. So my job is to make sure that they don't have to worry about what the exchange rate will do. The objective is to stabilise the company. Hedging is giving the company time to put its house in order to meet the changes in the exchange rates.
>
> We are definitely risk averse. Our aim is to minimise the impact of exchange rate changes on our share price and the economic performance of our company.
>
> Our primary aim is to avoid a major loss.
>
> We are not risk averse. Here in the treasury of the head office we are risk seeking in relation to the additional return. Our operating companies are advised to minimise their risks.

It also proved interesting to compare the answers with earlier statements made by the managers. If the approaches towards the management of transaction exposures are taken as an indicator of risk attitudes, one can group the sample into three categories: six companies were 'totally risk averse', six were 'fairly risk averse', and four were 'risk takers'. Table 5 in the Appendix compares these figures with the above answers.

In all, the study produced mixed results as to the risk attitudes and the exchange risk management objectives of the interviewed MNCs. Nonetheless, the survey shows that it is wrong to state conclusively that UK MNCs are risk averse and do not engage in speculative foreign exchange activities (see Rodriguez, 1981 and Mathur, 1982 who make such assertions of US MNCs; see also Collier & Davis, 1985 who investigated UK MNCs and found results similar to those of the present study). The reality is more complex and varied than suggested by such generalisations. Some MNCs undoubtedly are risk averse and cautious. Others operate a discretionary hedging policy and accept the risks inherent in this. With these companies, hedging decisions are often guided by personal 'views' on future exchange rate movements and the objective is clearly to profit by 'outguessing' the markets. Another group of MNCs has gone further than that. They have accepted foreign exchange trading (corporate treasurers prefer the term 'trading' to the term 'speculation' which has a negative, accusing connotation) as part of their business and operate a highly sophisticated exchange risk management which in some respects is comparable to that of smaller or medium-sized banks.

In summing up, one can say that of the UK MNCs surveyed only a minority were risk averse in the full meaning of the term. The majority to varying degrees accepted the risks inherent in uncovered foreign exchange exposures, or even sought to increase these risks in order to profit from their foreign exchange risk management.

Concluding remarks

The key conclusions that can be drawn from the research are as follows. Despite the financial literature demonstrating that accounting exposure is not a useful concept for corporate foreign exchange risk management, the study identified a majority of companies which were prepared to manage actively their net accounting exposures. The majority saw transaction exposure management as the centrepiece of their foreign exchange risk management. The literature establishes economic exposure as the most appropriate concept for corporate foreign exchange risk management. The complex nature of the topic and the great diversity of the companies interviewed not surprisingly produced very heterogeneous results in this area of the study.

The study sought to ascertain to what degree and in what ways the MNCs had centralised their foreign exchange risk management and how policy decisions were derived. A large majority of the MNCs had centralised at least to some extent. However, the surveyed MNCs showed a lower degree of centralisation than could have been expected on the basis of the relevant literature.

The majority of interviewees described their companies as 'totally risk averse'. A substantial minority indicated that, although they aimed to make profits on their foreign exchange risk management and did not hedge all of their exposures, their approach could correctly be described as 'risk averse'. A small minority characterised their companies' attitudes as 'risk taking'. The results lead to the conclusion that it is wrong to state conclusively that UK MNCs are risk averse and do not engage in speculative foreign exchange activities.

These conclusions are interesting in themselves, because of the relative importance of the respondent companies in the UK economy. However, when reviewing these results one must bear in mind the limited nature of the study undertaken.

References

Ankrom, R. K. (1974) 'Top-level approach to the foreign exchange problem', *Harvard Business Review*, July/August, pp. 79–90.

Buckley, A. (1986) *Multinational Finance*, Philip Allan, Oxford.

Collier, P. & Davis, E. W. (1985) 'The management of currency transaction risk by UK multi-national companies', *Accounting and Business Research*, Autumn, pp. 327–334.

Cooper, I. & Franks, J. (1987) 'Treasury performance measurement', *Midland Corporate Finance Journal*, Winter, pp. 29–43.

Cornell, B. & Shapiro, A. C. (1983) 'Managing foreign exchange risks', *Midland Corporate Finance Journal*, Fall, pp. 16–31.

Donaldson, J. A. (1987) *Corporate Currency Risk. A Reappraisal*, Financial Times Business Information, London.

Flood, E. & Lessard, D. R. (1986) 'On the measurement of operating exposure to exchange rates: a conceptual approach', *Financial Management*, Spring, pp. 25–36.

Lighterness, T. (1987) 'Managing economic exposure', *Treasurer*, February, pp. 13–15.

Mathur, I. (1982) 'Managing foreign exchange risk profitably', *Columbia Journal of World Business*, Winter, pp. 23–30.

Pausenberger, E. & Voelker, H. (1985) *Praxis des internationalen Finanzmanagement*, Gabler Verlag, Wiesbaden.

Rodriguez, R. M. (1981) 'Corporate exchange risk management: theme and aberrations', *Journal of Finance*, May, pp. 427–439.

Shapiro, A. C. (1989) *Multinational Financial Management*, 3rd edition, Allyn and Bacon, London.

Stonehill, P., Ravn, N. & Dullum, K. (1982) 'Management of foreign exchange economic exposure', in Bergendahl, G. (ed.), *International Financial Management*, Kluwer, Deventer, pp. 128–148.

Walker, D. P. (1978) *An Economic Analysis of Foreign Exchange Risk*, Institute of Chartered Accountants in England & Wales, Research Committee Occasional Paper No. 14.

Wihlborg, C. G. (1980) 'Currency exposure: taxonomy and theory', in Levich, R. M. & Wihlborg, C. G. (eds.) *Exchange Risk and Exposure—Current Developments in International Financial Management*, DC Heath Lexington Books, Lexington (Mass.), pp. 23–44.

APPENDIX

Summary of Findings

Table 1

Accounting exposure management*

Strategy	*Number of companies*
Influenced accounting exposures through the gearing of overseas subsidiaries; would not attempt to hedge remaining net asset exposure	2
Had explicit policies as to the management of their accounting exposures	5
Closely monitored accounting exposures and would take action under certain circumstances; did not continuously manage accounting exposures	6
Accounting exposures considered to be without relevance	3

*Only 16 respondents.

Table 2

Transaction exposure management

Importance of transaction exposure management	*Number of companies*
Day-to-day management of transaction exposures centrepiece of foreign exchange risk management	14
Transaction exposure management of minor importance; balance sheet exposures relatively more important	2
No point at all in managing transaction exposures	1

Table 3

Economic exposure management*

Strategy	*Number of companies*
Based foreign exchange risk management on cash flow forecasts; degree of sophistication and time horizons used varied greatly	10
Made no attempt to forecast and analyse future cash flows in order to manage economic exposure; incurred and reported transaction exposures formed basis of exposure management	6

*Only 16 respondents.

Table 4a

Centralisation of foreign exchange risk management

Degree of centralisation	*Number of companies*
High	9
Low	7
Completely decentralised	1

Table 4b

Treasuries as profit centres

Strategy	*Number of companies*
Run as profit centres	2
Not prime objective to make profits; treasuries characterised as 'service centres' or 'negative cost centres'	9

Table 5
The companies' exchange risk management objectives*

	Number of answers to direct question	*Analysis of actual transaction exposure management*
Totally risk averse	9	6
Fairly risk averse	4	6
Risk taking	3	4

*Excluding the company not attempting to manage its transaction exposures.

Journal of Business Finance & Accounting

Winter 1990 *Editor: Richard Briston* *Vol. 17 No. 5*

Contents

Participation in the Lloyd's Insurance Market as a Portfolio Investment
by MICHAEL ACZEL, JACK BROYLES AND BRONEK MASOJADA

Capital Market Reactions to Accounting Policy Deliberations: An Empirical Study of Accounting for Foreign Currency Translation 1974–1982
by ZABIHOLLAH REZAEE

An Investigation of Seasonality in Stock Price Responses to Quarterly Earnings Announcements
by WILLIAM KROSS AND DOUGLAS SCHROEDER

Variance and Lower Partial Moment Betas as Alternative Risk Measures in Cost of Capital Estimation: A Defense of the CAPM Beta
by GHASSEM HOMAIFAR AND DUANE B. GRADDY

International Mergers: Returns to US and British Firms
by R. L. CONN AND F. CONNELL

Income Smoothing by Economy Sector
by W. DAVID ALBRECHT AND FREDERICK M. RICHARDSON

Single Sale Divestments: The Impact on Stockholders and Bondholders
by KAREN CRAFT DENNING AND KULDEEP SHASTRI

Optimal Output in an Option Pricing Framework: An Agency-Theoretic Perspective
by JACQUES A. SCHNABEL

Valuation by Linear Programming—A Pedagogical Note
by L. PETER JENNERGREN

Discounting of Deferred Tax Liabilities
by BRETT COLLINS, JOHN RICKARD AND MICHAEL SELBY

A Note on Simple Resource Allocation Rules: The Case of Arithmetic Growth
by GARY A. ANDERSON AND ARUN J. PRAKASH

Subscriptions

	1991 volume			
	UK	Europe	Rest of the World	North America
Institutions, libraries and professional	£93.00	£96.00	£110.00	$200.00
Teachers or students	£40.00	£42.00	£48.00	$87.00

Journal of Business Finance & Accounting and Financial Accountability & Management (combined rate)

	UK	Europe	Rest of the World	North America
Institutions, libraries and professional	£104.00	£108.00	£120.00	$218.50
Teachers or students	£48.00	£50.00	£58.00	$105.00

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford, OX4 1JF, UK. Editorial communications to *JBFA*, Department of Accountancy, University of Hull, Hull HU6 7RX, UK.

The Origin of General Limited Liability in the United Kingdom

E. A. French*

Abstract—This article discusses the introduction of general limited liability into the United Kingdom. This was effected by the independent Irish Government through a Statute it enacted in 1782, commonly referred to as the Anonymous Partnership Act. The article explores the political and economic circumstances of eighteenth century Ireland which led to the passing of the Act. It summarises the provisions of the Act and seeks to highlight the insights which it gives into the nature of the limited partnership form of business organisation. An appendix provides statistics which demonstrate the infrequent use that was made of the Act. The probable reasons for this are discussed. The article concludes by pointing to some general lessons that can perhaps be learned from a study of the history of this Irish experience of employing an innovative commercial form of business organisation.

Introduction

In 1854 the debate on the question of whether or not general limited liability should be introduced into Britain was reaching its climax. There was a great contrariety of opinion. Some opposed limited liability as being morally wrong, in that it involved dishonouring obligations freely undertaken. Others argued for its introduction. They believed it would facilitate the finance of large scale activity, a need heralded by the arrival of the railways[1].

The Government of the day seemed antagonistic towards general limited liability. Its advocates were thus having a hard time fighting their corner. One argument they employed was that Britain was almost alone in not having it[2]. They drew attention to the fact that general limited liability had existed in the USA and in most continental countries for many years, where it had proved to be beneficial and non-controversial. They were thus embarrassed when it was pointed out to them that general limited liability had also existed in a part of the United Kingdom (Ireland) for over 70 years and had there proved to be a failure[3]. The Anonymous Partnership Act of 1782 (21 and 22 Geo 3, Cap 46, Ireland, hereafter 'The Act') permitted the creation of limited partnerships by a process of registration but, as the statistics in the Appendix demonstrate, little use had been made of its provisions.

The background to the Irish statute

Following the Williamite settlement of 1701, 18th century Ireland was controlled by the Protestant Ascendancy. Nearly all political and economic power was concentrated into Protestant hands, as was the ownership of most of the land. The Roman Catholics, who accounted for the vast bulk of the population, constituted one of the poorest peasant populations of Europe. They laboured under severe political, economic and social disabilities[4].

Despite the Protestant Ascendancy, Ireland was still a dependent country. Its strategic importance to Britain, as a site from which an invasion could be launched from the west, meant that no British Government could feel easy in letting ultimate control of Ireland rest in hands other than its own. Hence, as an aspect of conquest, Britain had claimed and exercised the right to control Irish legislation (Poyning's Law)[5] since 1495 and had also insisted that the English House of Lords was the ultimate appellate court for the Irish legal system[6]. The Irish economy was also subject to British control. To all intents and purposes it was run as the economy of a dependent colony, for the benefit of Britain. Many Irish industries suffered disabilities which were designed to protect the interests of their British competitors. This was especially the case with regard to the woollen industry. The controls exercised over it were greatly resented, in that they highlighted the political dependence of Ireland on Britain[7].

---

*The author is a professor of accounting at the University of Wales, College of Cardiff. He is indebted to J. R. Edwards for helpful comments on an earlier draft, and acknowledges the financial help of the Research Board of the Institute of Chartered Accountants in England and Wales. Many thanks are due to Viscount Massereene and Ferrard, D.L., and to the Deputy Keeper of the Records of Northern Ireland for permission to draw on the papers in the Foster/Massereene archive of the Public Records Office of Northern Ireland.

While religion divided Ireland, the schism between Catholic and Protestant in the 18th century was not as violent and bitter as it had been and was to become[8]. A spirit of Irish nationalism, embracing all Irishmen, had been growing. Members of the Protestant Ascendancy certainly viewed Ireland as the permanent home of themselves and their descendants. The existence of their magnificent Georgian homes, their clubs and societies, confirms this. Although they recognised their reliance on British power, they also resented it, and hankered for an independent Ireland.

The war of American Independence created a golden opportunity to forward this aim. By 1782 Britain was opposed by the American States, France, Spain and the Northern Alliance. French invasion of Ireland seemed imminent, and so armed groups of Irishmen, the volunteers, were formed to counter this danger[9]. But the volunteers were also persuaded of the wisdom of Grattan's view[10] that constitutional nationalism was the way forward for Ireland. Defeated abroad, and facing the possibility of armed insurrection in Ireland, the British Government gave way and granted the Irish parliamentary independence. From 1782 to 1801 the only substantial link between the Irish and British Parliaments was the common sovereign, George III[11].

The independent Irish Parliament (Grattan's Parliament) was keenly interested in economic matters. The deep poverty of their country distressed most Irishmen. They had resented economic control by Britain and had viewed with disquiet the emigration of skilled Protestant workmen to North America[12]. They also believed that Ireland should be a prosperous country. It had rich soils, a temperate climate, plentiful cheap labour and abundant waterpower. Concerned Irishmen could see no good reason why their country should not be as prosperous as Britain. They attributed their poverty largely to poor economic institutions and arrangements. They were determined to do something about them. The early years of Grattan's Parliament thus witnessed a welter of Acts concerned with economic questions. There was a belief that prosperity could be obtained by legislation[13].

The Anonymous Partnership Act 1782

Among the first of such acts was the Partnership Act of 1782. The dependent Irish parliament had attempted on prior occasions to obtain an Act which would permit limited partnerships, but had always been thwarted by the British Government, which was opposed to the idea[14].

The desire for such an Act flowed from a wish to cure a perceived lack of capital for Irish industry[15], a problem from which British industry did not suffer[16]. Precisely what contemporaries meant by a 'lack of capital' is not clear[17]. There seems to have been a belief that allowing people to share in the profits of a business, while at the same time putting a limit on the losses they could incur, would both increase savings and divert a greater proportion of the overall supply to commercial and industrial concerns.

The need for such encouragement has to be viewed against the general state of commercial law as it existed in Ireland in 1782. In the abstract the basic aim of stimulating investment in manufacturing and commerce could have been achieved by allowing loans to be made to businesses at high rates of interest, or at rates of interest that were a function of the profitability of the business. The usury laws prevented the first[18], and the partnership laws, which held that any participation in profits constituted the recipient a partner with full liability, the second[19].

In 1782 the law of business organisation was chaotic. In the aftermath of the South Sea Bubble a statute was enacted in 1720[20] which embodied the general public feeling that joint stock activity was an evil which had to be most rigorously controlled. It became all but impossible to obtain corporate status. But its adjuncts, limited liability, the right to sue and be sued in the corporate name, perpetual succession, joint stock and the transferability of such stock, were highly prized by businessmen. They, through their counsel, devised ways of achieving these benefits. The devices used, however, were cumbersome, expensive and of doubtful legality. This was especially the case with regard to legal proceedings by or against such associations so formed. The need for a change in the law of business organisation was almost as much rooted in these procedural difficulties as it was in the desire for general limited liability[21].

The idea of limited liability was not new. It had existed for centuries. It flowed from the separate legal personality of the corporation[22]. It was soon recognised that corporation debts were not the debts of the members but of the body corporate, although questions of the liability of members to meet calls from the corporation, so that it could discharge its debts, long remained unresolved. Limited liability could also be obtained by contractual stipulation. Insurance companies made extensive use of this device[23]. What was new was the idea of obtaining limited liability by a process of registration. The Irish were aware that such a system existed in France[24] (the partnership *en commandite*) and it was this that they wished to introduce.

The provisions of the Act

The contents of the Act, which was subsequently amended by the Irish Statute 25 Geo 3 Cap 34 (1786) and repealed by Section 205 of the Companies Act 1862, are as follows.

Section 1 states that an increase in capital employed by trade and manufacture will raise the prosperity of Ireland and that such an increase might result from the introduction of limited liability. Hence the Act permits any number of people to form a partnership for the purpose of wholesale trading, manufacture or business, for a period not exceeding 14 years. Such partnerships are to have a joint stock of between £1,000 and £50,000.

Section 2 provides that the partners are to appoint from among themselves one or more acting partners, with responsibility for the management of the firm. The business shall be carried on in the name of the acting partners, who shall have unlimited liability for its debts.

Section 3 provides that the remaining partners, who are to have no part in the management of the business and whose names are not to form part of the firm's name, shall be known as anonymous partners. No other partner, nor the partnership stock, is to be liable for their debts. The anonymous partners shall not be liable for the contracts of the acting partners, save as subsequently provided for by the Act.

Section 4 provides that, on formation, each anonymous partner is to pay into the firm one quarter of his agreed capital contribution; the remaining three quarters is to be paid in within a year. Should an anonymous partner fail to pay this remaining sum at the due time he is to forfeit, for the benefit of the creditors and the other partners of the firm, the one quarter he has paid in, together with the profits thereon. If subsequently the business fails, such a defaulting anonymous partner shall be liable to pay a sum of up to three quarters of his agreed capital to the partnership creditors. However, if at the conclusion of the partnership business it shall have generated sufficient funds to enable the capital of the other partners, together with interest thereon, to be returned to them, the defaulting anonymous partners shall have the one quarter of their capital they have contributed returned to them.

Section 5 provides for the drawing up of annual accounts for the firm, which are to be signed by the acting partners and at least two thirds of the anonymous partners.

Section 6 provides that anonymous partners may withdraw no more than a half of their share of the annual profits, the remainder being retained within the firm.

The limitation of the liability of the anonymous partners is governed by Section 7. It provides that anonymous partners who have duly paid their agreed capital, and properly re-invested one half of the profits attributable to them, shall incur no further liability on account of the firm's debts. Where the capital fund of the firm exceeds its debts the capital of the anonymous partners is proportionately liable. Should the firm be dissolved before the due date for the contribution of the three quarters of his capital, the liability of an anonymous partner is to be limited to that sum.

Section 8 provides that, in the absence of agreement to the contrary, the death or bankruptcy of an anonymous partner shall not dissolve the partnership. Provided they pay any capital due from the deceased or failing partner, the legal personal representatives, assignees, or those who buy such claims at public auction, shall stand in their place and become anonymous partners. In the absence of any such representation the deceased or failing partner's paid in capital shall be forfeit. The section also provides that, when there are two or more acting partners, the firm, in the absence of agreement to the contrary, shall not be dissolved provided at least one of them remains alive and solvent.

Section 9 provides that, where there is at least one solvent acting partner, no partnership shall be considered to be dissolved before the expiration of its prescribed life, unless such dissolution shall have been advertised twice in the Dublin Gazette, and the fact of dissolution recorded in the Registrar's book.

Section 10 provides that no partner shall be able to sell his share, so as to introduce a new partner in his stead, unless the partnership deed allows it, or the other partners consent to it. Where a new partner so joins the firm, the original partner, unless he has paid his capital in full, shall still be liable, until such time as the new partner pays it.

Section 11 provides that each partnership formed under the Act shall sue and be sued in the original name of the firm. Provision is made to deal with instances where the original acting partners die or become bankrupt. The amending Act[25] reconciles the provisions of this section with those of a previous Act. The case of *Lindsay and Company v Loughead*[26] is concerned with the interpretation of Section 11.

Section 12 provides that the other partners may not use the name of an assignee in legal proceedings unless they have previously indemnified him.

Section 13 provides that the deed of partnership must be registered at the public registry office in Dublin. It deals with the mechanics and cost of registration. The details to be registered are the date of the partnership deed, the period of the partnership and the names and agreed capitals of the anonymous and acting partners. The payment to the firm at its formation of one quarter of its capital is required to be attested.

Section 14 provides that all contracts, debts, dealings or other engagements which existed at the time of the execution of the partnership deed, or subsequent thereto, between an anonymous and acting partner shall be void as between the partners, unless they have been fully disclosed in writing to, and similarly approved by, the remaining partners.

Section 15 provides that the debts due from an anonymous to an acting partner, arising from transactions approved of in accordance with Section 14, shall be treated as any other debt regarding the timing of its payment and the method of its recovery.

Section 16 provides that an anonymous partner, or his successors, shall lose his limited liability if it appears to the Lord Chancellor that he has made any fictitious or colourable payment of capital to the firm, received a greater share of profits than the deed of partnership allows, sought to elude the provisions of the Act, or to deceive or defraud his fellow partners or creditors of the firm.

Section 17 provides that the anonymous partners are to keep books of account and draw up annual accounts for the partnership business, their other business dealings and their private affairs. It prohibits them from using the partnership property or credit for their own advantage and requires that they do not wilfully refuse to settle accounts with their co-partners. If an anonymous partner is in breach of any of these requirements, the acting partners, in addition to the other remedies the law provides, may recoup £20 per each £100 of capital and profits of the anonymous partner from him.

Section 18, the final section of the Act, provides that no partnership for carrying on the business of bankers or discounters of money for shop keepers selling by retail can be formed under the provisions of the Act.

The significance of the Act

The Limited Partnership Act of 1907[27] is the only other United Kingdom statute to provide for the creation of limited partnerships. But the Act of 1907 was virtually a dead letter. By the time it reached the statute book it had been possible to obtain limited liability, by the process of registering an appropriate company, for over fifty years[28]. The main disadvantage of registered companies, so far as small businesses were concerned, was the publicity extracted as the price of limited liability. But the Companies Act of 1907[29] brought into existence private companies, for which disclosure requirements were extremely sparse. As the major sphere of partnership organisation was that of the small firm, the 1907 Companies Act all but destroyed any chance of success the Limited Partnership Act 1907 may have had. Thus the only real experience the United Kingdom has had of limited partnerships relates to those formed under the 1782 Act.

The Act illustrates the great differences which exist between normal partnerships and limited partnerships. The law as it relates to ordinary partnerships is pervaded by a spirit of equality and co-operation between the partners[30]. The partnership contract is one *uberrimae fidei*[31]; that is the utmost good faith between the partners is an implied term of every partnership agreement. In lay language, the judges tend to view the partners of a firm as a brotherhood. Unless there are express terms to the contrary, all are entitled to participate in the management of the concern and to an equal share of profits and losses. The death or bankruptcy of one of them dissolves the partnership[32].

Such is not the case with the limited partnerships permitted by the Act. The essence of the position of the anonymous partners (to whom limited liability attached) was that they did not share equally in the losses. The loss to which they were exposed was absolute, not proportionate. Nor did they have, or desire, any right to participate in management. Neither did their death or bankruptcy automatically dissolve the firm, which continued so long as at least one acting partner survived. They were thus largely separated from the day to day affairs of the firm of which they were partners. They thus constituted a distinct class of partners.

The limited partnerships the Act permitted were also very different to companies. Unlike them, they had no separate legal personality. Hence the conceptual basis of the limited liability of the anonymous partners was different to that of company shareholders[33]. The limited liability attached to the relationship between the creditors and the individual anonymous partner, not to the relationship between the creditors and the firm, as in the case of a company. The protection offered to creditors also differed. The main safeguard for a company's creditors is provided by its capital fund. In an ordinary partnership the personal liability of the partners fulfils this function. The creditors of the partnerships permitted by the Act were defended by both of these devices.

The existence of the separate legal personality of a company facilitates the creation of shares in it and the transferability of such shares. This transferability is a vital part of modern financial arrangements. Without it, the widespread separation of ownership from management would be impossible. But the fact that limited partnerships were heavily influenced by partnership ideals and law militated against such transferability. As Section 10 of the Act has it, 'none of the said original partners, nor the purchaser or purchasers of the share or shares of a deceased or failing partner, shall have liberty during the term of the said partnership, to sell or dispose of his or her share in such partnership dealing, so as to obtrude another person as partner in the said company, unless upon such terms and with such consents as shall be specified in the said partnership deed, or with the consent of all the other partners'.

It is thus possible to view the Act as creating a type of business institution which combined certain features of the traditional partnership and the statutory company. The need for it was based upon the requirement for a new type of finance, more than on the necessity, on general grounds, to expand the range of business organisations. What was required, in view of the law relating to usury and to partnership, was some mechanism which would allow individuals to invest their capital in businesses in such a manner that they could share in the profitability of such ventures, while at the same time limiting the extent of their responsibility for losses. Such investors also wished to be mere receivers of income. While they wanted general control of their investment, they did not wish to participate in the day to day management of its use.

Contemporaries considered loans at high interest and the shares of limited partners in the joint stock of a partnership as very similar types of long term finance[34]. However, from the trade creditor's viewpoint, the latter was preferable. In the case of failure a loan creditor, who effectively might have received most of the profits of the firm, would be able to prove in the bankruptcy along with the other creditors, so reducing the dividend available to them[35]. An anonymous partner would not be able to act in this manner. Contemporaries were also concerned that loan creditors would be able to withdraw their money from the partnership far more easily than anonymous partners, so adding instability to the firm, and that the information which their position would allow them to insist upon (perhaps more than anonymous partners were entitled to) would signal to them when it was wise to do so. By creating a new type of long term finance which avoided these dangers, the policy underlying the Act of 'encreasing the stock of money employed in trade and manufacture' was perhaps advanced through an increased supply of trade credit to businesses.

The distinction between acting and anonymous partners was believed to generate different attitudes towards risk by the two classes. One aspect of this was that, because the liability of the anonymous partners was limited, the losses borne by the acting partners would be geared up once the limit was exceeded. It was believed that this would make wealthy acting partners cautious in their conduct of the firm's affairs. Such a gearing effect might strike the modern shareholder as unusual. He is used to geared profits, not geared losses.

It is natural for anyone who invests money in a business to be concerned with its administration, in so far as it reflects on the security and profitable use of his funds. Even when an investor desires no part in management, he usually distinguishes between delegation and abandonment, and seeks to keep himself informed about the business. In the abstract the rights attaching to company shares have coped adequately with this problem.

Such was not the case so far as anonymous partners were concerned. Section 3 made it clear that they should not 'have the actual management of the said trade, business or manufacture' in their hands. Infraction thereof involved loss of limited liability, on the grounds that any creditor dealing with a firm so conducted could argue that the anonymous partner had held himself out as liable.

But the Act also provided in Section 5, 'that a full account or rest in writing, shall be made once in every year, or more often, of all the goods, wares and merchandises, bonds, bills and notes, debts, monies and other effects of or belonging to said copartnership, and of all debts owing by them, and a fair balance struck of the whole, and of each particular partner's share, and signed by the acting partner or partners, and at least two thirds of the said anonymous partners, or their respective attorneys for that purpose lawfully constituted with the approbation of the said partners'.

Section 5 was interpreted by contemporaries as indicating that the anonymous partners should be consulted about, and allowed to advise on, the firm's affairs. This was viewed as being an internal matter, not impinging on the external relationships with the creditors of the firm. But the line between internal and external involvement was a fine one, and a wrong decision as to its location could involve the loss of limited liability. The details of modern company legislation relating to the provision of information to, and control of the company by, its shareholders, seem, despite shareholder apathy, preferable to the mechanisms provided by Sections 3 and 5 of the Act.

One advantage that contemporaries saw for limited partnership was that it allowed the conduct of the concern to be assured to the acting partners. The rules relating to management and to the transferability of interest meant that the acting partners would be largely left in peace to get on with the conduct of the business, and would be most unlikely to be troubled by takeover bids. Such considerations were seen as being especially important to impecunious inventors who wished to retain control of the development of their ideas[36].

The Act was the first attempt in the United Kingdom to create general limited liability. As such it prejudiced creditors, whose interests were well protected by the existing law. It was inevitable that something would be done to safeguard their position from the obvious dangers so created. In the creditor protection devices contained in the Act we can see the origin of many of the defence mechanisms of modern company law. There has been a great expansion and refining of detail since 1782, but few new ideas have emerged.

The major concept underpinning these safeguards was publicity. In an age of *laissez-faire*, men were thought to be the best judges of their own self interest. It was felt that, provided they were made aware of the nature of the concern to which they were proposing to grant credit, the dangers inherent in limited liability could be largely contained. Indeed it was sometimes argued that such publicity was more useful to creditors than the personal liability of the proprietors of a firm. When owners were liable without limit for their firm's debts, it was often impossible to discover the extent of their wealth; the source of the practical usefulness of unlimited liability. External appearances were frequently deceptive and creditors consequently prejudiced[37].

Contemporary lawyers used the requirement for publicity to produce a conceptual justification for general limited liability[38]. It had long been possible to obtain limited liability by an express clause in a contract. Where publicity existed creditors were considered to have impliedly rather than expressly accepted constraints on their claims. This was considered to justify general statutory provisions limiting liability.

Turning to details, we can seen that the Act made an early attempt to put creditors on their guard by paying attention to the names of the firms it generated. The appropriate part of Section 1 runs: 'the said subscribers or co-partners may by such partnership deed, nominate and appoint from amongst themselves, one or more person or persons, to manage, conduct or carry on said trade, business or manufacture, in whose name or names whilst living and continuing in credit, with the addition of "and company" the business of said partnership shall be transacted and carried on'. While the phrase 'and company' does not perhaps have the same red flag impact as 'limited', and it is to be doubted whether its use was restricted to partnerships formed under the Act, it did serve as a warning. Section 1 also achieved a substantial improvement in the contemporary practice of naming firms, which appears to have been totally unregulated. There was nothing to prevent an unlimited partnership conducting its affairs under the names of ex-partners long since dead, and to whose wealth creditors of the firm could have no recourse[39]. At least the creditors who dealt with a firm formed under the Act would be alerted to the identity of the persons to whose personal fortunes they could look for the settlement of their debts.

Precisely where, and on what documents the name of the firm was to appear was not specified: an example of how later legislation fleshed out a basic idea which originated with the Act.

The major way in which publicity was to be achieved was by registration. Section 13 contains the details. They constitute the acorn out of which the modern oak was to grow. The most obvious omission, to modern eyes, is of any requirement to file the accounts of the firm. But, given the pioneering nature of the Act and contemporary attitudes to financial privacy, this omission is perhaps not unexpected.

What is surprising is that the required details had only to be registered in the public registry in Dublin. The procedure adopted seems to have drawn from the law relating to pawnbroking[40]. This might not have been the most apt model to follow. The economies of the late 18th and early 19th centuries were highly local. Publicity achieved through registration in Dublin may have, for many firms, been equivalent, for practical purposes, to no publicity at all. The practice of the State of Massachusetts[41], which insisted on the registration of the details of limited liability firms in the town house of the settlement where they had their major seat of activity, might have been a better pattern to copy.

The maintenance of the capital fund of the company is another major defence against the dangers inherent in limited liability, which modern company law offers to creditors. It is, to be sure, a device of suspect utility, some of the weaknesses of which were revealed by the operation of the profit retention provision of the Act[42]. Its origin in the general statute law of the United Kingdom can again be traced to the Act. Sections 6 and 7 thereof contain the requirements. They are, again, very sparse, but are based on a philosophy, which has not changed since 1782, that the liability of the individual is replaced by the liability of a fund. The limitation, by Section 1, of the life of partnerships formed under the Act to a maximum of 14 years foreshadowed the development of the *ultra vires* rule, another creditor protection device.

The use made of the Act

The Appendix[43] reproduces some statistics that have survived of the use made of the Act. They paint a dismal picture. In the 72 years between 1782 and 1854 only 509 limited partnerships were formed under its provisions. It is doubtful whether many more came into existence in the period 1855 to 1862, after the Companies Act of 1855 had made limited liability for companies generally obtainable by registration. Despite the policy underlying the Act, the initial subscribed capital of the 509 firms amounted to a paltry sum of just over £2 million. This illustrates the depth of the embarrassment that the existence of the Act created in 1854 for the British advocates of general limited liability.

Although no details of the loan capital raised by these firms can be discovered, the statistics provide strong evidence of the small scale nature of Irish firms. The lower limit of £1,000 capital imposed by Section 1 was of practical significance. Between 1829 and 1853 sixty four partnerships were formed under the provisions of the Act. For thirteen of them (20% of the total) their capital at formation amounted to exactly £1,000. At least some of them may have been over capitalised, so as to reach this required minimum. In contrast, none of the sixty four firms had capitals which remotely approached the maximum of £50,000 imposed by Section 1. The small scale of Irish firms is also illustrated by the fact that, in the period 1782 to 1853, the average subscribed capital per partnership was but £4,128.

Reasons for the failure of the Act

The failure of limited partnerships in Ireland was unusual. In America and on the continent they had proved to be a success. Thus the failure of the first experience of general limited liabilty in the United Kingdom seems to call for an explanation.

Economic Considerations

One reason for the failure of the Act lay in the condition of the Irish economy.

The late 18th and early 19th centuries saw a rapid increase in the population of Ireland[44]. Housing was cheap, consisting in the main of mud cabins. Fuel, in the form of peat, was also cheap and plentiful. The potato, very nutritious, easily grown and highly efficient in its use of land, provided food. With the basic necessities of life thus provided for, Ireland's population expanded to 8 millions by the early 1840s, the greatest figure it has ever reached. But the very heavy dependence on the potato contained an obvious danger which came home to roost in the tragedy of the famine, and from the mid-1840s Ireland's population declined steadily[45].

Because of the increase in population during most of the years when the Act was in effect, it operated in what was virtually a subsistence economy. As the efforts to relieve the famine demonstrated, the vast bulk of the Irish population was economically self-sufficient. In many areas there was not even a network of retail distribution[46]. The Irish peasant grew and consumed his own food and made most of his own clothes. But he often had some cash income, and the use he made of this illustrates his basic poverty, and lack of purchasing power. Apart from trivial outlays, all of his cash was used to pay for the occupation of the land he cultivated.

The Williamite settlement had vested the ownership of most Irish land in the hands of the Protestant Ascendancy. They rented out the bulk of their holdings to the Catholic peasantry. The rents had to be paid either in labour or cash. Where they were paid in cash, the peasant obtained the money from the sale of his pig (which most families kept), from the wages he earned from migratory labour or from his activities in the domestic textile industries. These latter earnings were eroded as the 19th century progressed by the increasingly fierce competition from the factory textile production of Britain[47].

The land tenure system of 19th century Ireland was complex and inefficient. One of its features, the absentee landlord and his attendant middleman, probably deepened Irish poverty. The rents left the country for England and were spent there, not locally, to the detriment of Irish commerce.

Religion also added to the economic burdens of the Irish peasant[48]. Tithe had to be paid to the Anglican Church of Ireland. But, as most of the population were not members of this church, the payment was more in the nature of a tax than a support of their religion. The latter was paid for separately, in the donations which the Catholics and Presbyterians made to their churches. Religion in Ireland was thus a comparatively expensive business.

In the late 18th and 19th centuries, the institutional arrangements of the Irish economy aggravated its problems. Between 1779 and 1801, Irish economic dependence on Britain largely gave way to economic independence. In this period, cheap labour, abundant water power, good transport and a plentiful supply of home produced wool seemed to offer excellent prospects for Irish industrialisation. Certainly British manufacturers feared Irish competition, as their opposition in 1785 to the proposed commercial arrangements between the two countries showed[49]. This age of prosperity, which the war time economy prolonged until 1815, was somewhat marred by the inability of the Irish parliament to conduct financial affairs successfully. In 1797–8 the Bank of Ireland refused to lend money to the Irish Government, which was forced to turn for aid to the British Government[50]. Such reliance on Britain did little to aid Irish industry and commerce.

The great weakness of the Irish economy, so far as industrialisation was concerned, was that the country had virtually no home based supplies of coal. Britain had, and so was able to develop large scale factory production. Thus, in the 19th century Ireland had on its doorstep the most powerful industrial nation the world had seen. And Ireland had been made especially vulnerable to competition from this source[51].

In 1801 the new political entity of the United Kingdom of Great Britain and Ireland was created by the parliament of each country enacting the necessary legislation. Irish parliamentary independence was destroyed. The extraordinary phenomenon of a parliament voting for its own destruction had been achieved by a combination of bribery, the promise of Catholic emancipation (which was reneged on) and the prospects of a common market between Britain and Ireland[52].

This common market was substantially achieved. But it proved to be a curse, rather than a boon, to the Irish economy. Communications between Britain and Ireland, and within Ireland, were greatly improved in the first half of the 19th century. At the end of this system of cheap transport lay the cheap mass production of Britain. Irish industry could not compete. The local monopolies, based on transport costs, which it had previously enjoyed, largely disappeared[53].

Against this background it is easy to appreciate that there was little economic activity on which the Act could bite. The one exception to the general economic depression of Ireland was Ulster. Here the linen industry, though it suffered its ups and downs, prospered. It had originally been encouraged by Britain as a quid pro quo for the destruction of the Irish woollen industry. Britain gave preferential treatment to its imports of Irish linen. The tariffs erected against Northern European and German producers did not apply to Irish linen. Behind this protective tariff wall the Irish industry grew and could well have provided a sphere of operation for the Act[54].

Although there were doubts as to whether the Act applied to agriculture[55], it may have provided opportunities to form limited partnerships. Because of the lack of industrialisation, the Irish economy was of an essentially rural nature. Many of the products of that economy (beef, leather, wool, bacon, etc.) were exported to Britain or used to victual the British navy[56]. The basic financial need of the businesses engaged in these activities was for working capital, rather than fixed capital, and firms formed under the Act could well have supplied it.

The originators of the Act hoped that it would greatly help the fishing industry[57], which they saw as providing both food and sailors for the navy. Proportionate to its area, Ireland has a long coastline and most of its major areas of settlement are by the sea. These seas teemed with fish. There was a tradition of partnership in the small existing fishing industry[58]. These factors generated the belief that, if the modest capital required for the nets and boats could be found, Ireland would develop a large and thriving fishing industry.

These expectations were disappointed. In many years of the 19th century Ireland was a net importer of fish. Even in the famine years, little food was produced from this source[59].

The explanation for the failure of the fishing industry to develop is difficult to find. Part of it may lie in the fact that Irish waters were extremely dangerous; part in the fact that fishing was for most of its participants but a part-time occupation, being an adjunct to agriculture. When times were hard, the boats and nets were the first things to be pawned or sold. Another cause was the failure of the originators of the Act to appreciate the type of capital investment needed. Ireland lacked social as well as industrial capital. Many facilities the fishing industry needed (harbours, piers, etc.)[60] were lacking.

Political Considerations

As well as being poor, Ireland was also divided. The mass of the population identified far more readily with Catholic Europe than with the Protestant Ascendancy and Britain. This natural bond was strengthened by the discrimination practised against them. Hence, when Britain was at war with Catholic European countries, there was always the danger that Ireland would rebel and provide a valuable base from which Britain could be invaded. This fear was realised in 1798 when revolution broke out. The French landed in Ireland to help the revolutionaries. They were easily defeated, and the rebellion put down with great brutality. The events of 1798, as well as generating lasting bitterness, served to underline the political instability of Ireland[61].

The disabilities of the Catholics also created continuing unrest. Agrarian outrages were common in both the 18th and 19th centuries. These appear originally to have been more concerned with opposition to tithes than to rent and tenure questions[62], but they eventually became linked to the ideas of revolutionary nationalism advocated by Wolf Tone[63]. Whatever their causes, they served to put property at risk, and introduced confusion into commercial affairs.

Against this political background, it is perhaps not unreasonable to suggest that investment in Ireland would have seemed more risky than investment in Britain. Irish capital, especially that of the absentee landlords, would be more likely to have been invested in Britain than in Ireland, and British capital to have remained at home or be invested in the colonies.

Knowledge of the Act's Existence

The conduct of commercial affairs is heavily influenced by knowledge and attitudes. The Act was not well known in Ireland[64]. Even among those who had heard of it, many misunderstood its provisions[65]. They viewed it with apprehension, considering it unworkable and incomprehensible. They believed that the limited liability it provided would be easily lost[66], and that the Irish judges would interpret it in a far less generous spirit than their French and American counterparts had applied to their equivalent legislation. The evidence to support the substance of these views is sparse, but exists in abundance to show that they were held[67].

The Act was also virtually unknown in Britain[68]. This ignorance worked against its widespread use. British firms that wanted the protection of limited liability were aware that it was obtainable in many other jurisdictions. There is evidence that they consequently located their firms in other countries. France seems to have been especially so used, with advantage to the French Treasury[69], and there are even instances of British firms registering in Constantinople to obtain the boon of limited liability its laws offered[70]. But there is no evidence of British firms using the Irish Act in this manner.

Irish Commercial Law

The success or failure of any statute is heavily influenced by its relationship to the rest of the body of law of which it is a part. However, this line of enquiry offers no real explanation for the failure of the Act. The three branches of the law to which it was most closely connected, debt, usury and procedure, were all in a state that would seem to have encouraged its use[71].

The contemporary law of debt was harsh. The example of Fordyce's failure had emphasised to the Irish commercial community exactly what the consequences of unlimited liability were[72]. This case was perhaps one of the factors which had caused the merchants of Dublin to petition Parliament to persuade it to pass the Act[73]. In 1782 the law of usury, which had been framed to protect spendthrifts, imposed an upper limit of 5 per cent[74] interest per annum on most loans. Thus the possibility of obtaining a high rate of interest on loans to businesses, as an alternative to a share in their profits, did not exist in 18th century Ireland. As the 19th century progressed the usury laws were all but abolished, and by 1855 they offered little barrier to loans at high interest rates to businesses; a point made much of by the British opponents of general limited liability[75]. The 18th century law of procedure, so far as it related to proceedings by or against the business combinations that the Bubble Act had spawned, was chaotic and virtually unworkable[76]. Writing fifty years later, Mill is scathing in his comments on the procedure of the Court of Chancery, where partnership cases were dealt with in Britain[77]. The provisions of Sections 11 and 12 of the Act should have appeared highly attractive to Irish businessmen. It is perhaps not without significance that both the amending statute and the sole reported case on the Act relate to matters of procedure.

The Provisions of the Act

A major reason for the failure of the Act lies in its provisions. It contains constraints not generally found in statutes pertaining to limited liability partnerships. Each of these can be explained by reference either to the dangers perceived as emanating from limited liability, or from the social conditions of Irish life. As such they made sense to those who enacted the measure. But common to them all is the feature of economic discouragement. Taken together they show how the utility of a concept can be all but destroyed by the restrictions surrounding its use.

Section 1 is replete with such limitations. It provided, *inter alia*, that the limited partnerships it legalises can be 'for the purposes of buying and selling in the gross, or by wholesale'. This provision, when read in conjunction with Section 18, excluded the retail trade from the scope of the Act. Such a prohibition probably made sense to those who enacted the measure. Ireland's was a subsistence economy. Such retailing as did exist was largely confined to urban areas[78]. It hardly formed part of the 'trade and manufacture' it was the policy of the Act to nurture. But the provision created difficulties. Its interpretation troubled contemporaries, especially as there were few firms which did not, on occasion, break bulk. Like all the other exceptions in the Act, infraction of it carried the penalty of the non-attainment of limited liability. This possibly served to widen the extent of the activities which were, in practice, excluded from the benefits of the Act[79].

Section 1 also provided that the Act was intended to apply to any partnership 'for establishing or carrying on any manufacture or business . . .'. This again caused difficulties of interpretation. As a later commentator was to point out, it was doubtful if such a phrase included 'the working of mines or quarries, or executing navigations etc., or farming or cultivating waste or other lands . . .'. An unsympathetic judge, unconvinced of the justice of limited liability, might reasonably hold these activities were excluded[80]. As Ireland's was a rural economy, which became increasingly so as the 19th century progressed, such doubts seriously limited the scope of the operation of the Act.

Section 1 also provides that partnerships formed under the Act shall be 'for any term not exceeding fourteen years'. This is of interest in that it reflects the fact that in 1782 the bundle of rights which we expect to attach to business organisations was not yet complete. Perpetual succession was excluded, as it was from many statutory and charter corporations. Limiting the life of the firm seems to have been viewed as a control mechanism. The scope for the acting partners to misapply the funds of the firm was set within a prescribed time horizon. However, some potential partners may have seen in this restriction a discouragement to forming limited partnerships, despite the fact that, in the consultation stage of the bill, the constraint seems to have been extended from seven to fourteen years[81].

The final provision of Section 1 is that the joint stock of any partnership formed under the Act should not 'be in any one of such companies or co-partnerships less in the whole than one thousand pounds or more than fifty thousand pounds'.

The reasoning behind the limit of £1,000 was twofold. First it was felt that, if no lower bound was set as to size, many small firms would be got up, to which the working classes, who were ignorant of financial matters, would be induced to subscribe their savings by the promised prospect of large profits. The unprincipled men at the back of such schemes would then defraud such investors of their savings[82]. Secondly, it was believed that the success of firms formed under the Act would depend on good management and that they had to be of a certain minimum size before they could afford this[83].

Laudable as these thoughts were, the lower size limit of £1,000 must have operated so as to prevent the combination of many small capitals. We can see from the statistics in the Appendix that this constraint was effective. If the number of firms falling into different size categories is visualised as an isosceles triangle, the £1,000 lower limit as to size would have cut off the bottom layer: the most numerous. Perhaps most potential fishing businesses fell within this band. On a wider view the constraint may also have militated against the achievement of one of the major social benefits that was considered to be associated with limited liability. Mill, in particular, believed that enabling working men to combine their capitals would help to remove many of the evils he saw as flowing from the division of the populace into the receivers of wages and the receivers of profits[84].

Prior to the introduction of general limited liability, the most common way for businesses to obtain limited liability was through the possession of a Royal Charter or a special Act of Parliament. Such instruments were very expensive to obtain and the privileges they granted were jealously guarded[85]. Limited liability had thus become associated in the public mind with monopoly power. This attitude probably lies behind the upper limit to firm size of £50,000 prescribed by the Act.

The statistics in the Appendix indicate that this constraint was of little practical significance. £50,000 was a large sum of money in 1782[86], especially in relation to the Irish economy. But had Ireland experienced the same level of industrialisation as Britain, matters might have been different. It was the needs of large scale activity, as illustrated by the railways, which lay at the heart of the British case for the introduction of general limited liability[87]. The £50,000 upper limit would have been unable to cope with this.

Section 6 provided that each anonymous partner 'may receive and take out of said partnership after a just and fair settlement of accounts as above mentioned, and not before, half and no more of his or their share or proportion of the net profits made by the said company on the sums paid in by them severally and respectively, and the residue of the profits . . . shall go towards encrease of said capital or joint stock, until the expiration of the term of their co-partnership'.

The policy underlying the Act was in part made necessary by the attitude of many 18th century Irishmen to business. In general they despised it and hankered for the life of a country gentleman[88]. Businesses were often sold once their value had grown to a sum which allowed their proprietor to purchase a landed estate. Retained profits were by far the most important source of finance in the United Kingdom in the 18th and 19th centuries[89]. Thus one reason for the provision of Section 6 might have been the desire to see owners make bigger and longer term investments in business.

However, the major reason behind this requirement was the desire to protect creditors. It was realised, though not vehemently argued as it was in mid-19th century Britain, that limited liability prejudiced creditors. The Act protects them in several ways, prominent amongst which was the maintenance by the firm of a capital fund.

In 1782 the details of the capital maintenance doctrine were still being worked out. One idea was that, to maintain the fund at its original level, annual losses should be made good by payments into the firm at the end of each year[90]. Another was that all profits withdrawn by limited partners should be available for the satisfaction of creditors' claims, on the ground that such abstractions had lessened the funds available to creditors[91]. But the disastrous effect that this would have on share transferability was recognised The provisions of Section 6 may thus well have been an experimental compromise between these views.

As Section 7 makes plain, the compulsory retained profits were, along with the original investment, liable for the satisfaction of creditors' claims. The creditors' protection fund was thus of indeterminate size until the close of the business. For a consistently profitable firm, it was also smallest at the commencement of the business and largest at its end. The risk to creditors probably followed the opposite pattern.

The magnitude of this fund would have been partly a function of the profitability of the firm. Logically it should have been related to its indebtness. There is no obvious connection between these two considerations. The size of the fund must thus have appeared somewhat arbitrary.

So far as the anonymous partners were concerned, the provisions of Section 6 increased the risk of their investment. If the assets that represented the retained profits were needed to satisfy creditors' claims the partners would not receive them.

To contemporaries the retention of half of the profits emphasised a basic weakness of the capital maintenance doctrine. The partnership might not be able to employ the retained funds at as high a rate of interest as the anonymous partners could obtain outside the firm. This would lead to a suboptimal use of capital. The practice seems to have grown of paying the anonymous partners' interest on their retained profits, and the complaint was common that the employment of the funds within the firm often produced insufficient revenue to meet such interest charges[92].

To potential limited partners, the provisions of Section 6 were a great disincentive to investment in a firm formed under the Act. Transferability of shares in such partnerships was probably not easy, so that the prospect that faced them was the compulsory reinvestment of half of the fruits of their capital for a period that could be as long as 14 years. During this period such reinvested profits would be at risk and might never reach their hands. Alternative ways of investing money, which did not suffer from these disadvantages, were far more attractive. There is little wonder that many contemporaries saw the compulsory retention of profits as one of the major causes for the failure of the Act[93]. It was a marvellous harbinger of the difficulties associated with national policies of dividend restriction.

Section 17 contains some rather unusual accounting requirements. The relevant part runs: 'any such acting partner or partners, who shall not, during the term of such partnership, keep honestly and fairly a book or books, in which shall be entered an account of all his or their dealings, bills of exchange, drawn, endorsed or accepted by him or them, and of his or their debts and credits, as well as on account of the said partnership, as on the foot of any other private dealing or dealings whatsoever, and of his or their expenses in housekeeping, and who shall not make out an inventory once in every year, during the term of the said partnership, in such a book or books, of all the said partnership effects, and his or their private effects (save furniture and wearing apparel) and of the debts and credits on the part of the said partnership, his or their private dealings (if any) specifying the profits and losses on the same for the time being....' The section also prohibits the acting partner from using the partnership money and credit on his own account and provides for a penalty of £20 per £100 of the acting partner's share of the joint stock of the firm should he be in breach of the section.

We have seen that the structure of a limited partnership was considered to produce different attitudes to risk by the two classes of partners. This generated the further belief that if the acting partners were men of little wealth they would be tempted to undertake highly risky ventures[94]. Should these prove to be a disaster they would lose little, as they had little to lose. Should they succeed the acting partners would share in the profits. The anonymous partners were barred by Section 3 from taking part in the management of the concern and so could not control this danger directly. But it was their capital which created the opportunity for impoverished acting partners to speculate. Hence it was felt that the property of anonymous partners should be guarded from this danger.

As Section 17 shows, the safeguard employed was to give the anonymous partners information about the wealth of the acting partners, so that they could compare the total resources of the acting partners to the investment they had made in the business and hence form a judgement as to the extent and probability of the danger.

It is clear from the wording of Section 17 that its provisions were primarily intended to protect the anonymous partners. There was no mechanism whereby the information it called for was made available to the public at large. Hence any protection it afforded creditors was a derived protection, which depended for its efficacy on the vigilance of the anonymous partners.

The disclosure of the information about his private financial affairs required by Section 17 may have been distasteful to many a potential acting partner. The statistics in the Appendix suggest that the danger the section was designed to guard against may have been illusory. Of the total capital of £2,100,964 subscribed to the 509 partnerships formed under the Act between 1782 and 1854, £839,587 (40%) came from acting partners and £1,261,377 (60%) from anonymous partners. The details of the 64 partnerships formed between 1829 and 1854 reveal that in only 14 instances (22%) did the acting partners subscribe no capital. To be sure the figures may have been different had not Section 17 existed, but the feeling remains that anonymous partners were sufficiently prudent in their choice of acting partners to defend themselves from the envisaged danger.

The final section, Section 18, contains the prohibition 'that no copartnership for carrying on the business of bankers or discounters of money for shopkeepers selling by retail shall be considered as formed under this act'. The exclusion of retailing from the scope of the Act has already been discussed. However, the further exclusion from the benefits of the Act of businesses providing banking or discounting services to them calls for some comment.

Contemporaries questioned whether all types of businesses, without exception, were suitable for the grant of limited liability[95]. Banking and insurance attracted their attention[96]. Insurance companies, were they so minded, could attempt to limit their liability to those they insured by appropriate contractual stipulation, and there was a feeling that this was the manner in which they should operate[97]. It was clearly not practicable for banks to include such contractual terms in the arrangements they made with their depositors. It was perhaps therefore considered undesirable that the partners in a banking business should be able to obtain limited liability by other methods. While the provisions of Section 18 did not exclude banking businesses *per se* from the ambit of the Act, the restricting of its benefits to banking businesses which did not deal with the retail trade must have severely limited the number of banks which were able to avail themselves of its protection.

The Act was but one of a series of statutes dealing with economic and commercial affairs enacted by the independent Irish Parliament[98]. Another was an Act of 1782 which established the Bank of Ireland. The Charter of the Bank, granted to it in 1783, prohibited the formation of any other bank with more than six partners. This created for it a virtual monopoly of joint stock banking in Ireland[99]. Section 18 can thus be viewed as a part of the overall banking policy of the independent Irish Government. Subsequently, following bank failures in the south of Ireland, the charter of the Bank of Ireland was amended by a Statute of 1821. It permitted the establishment of banks with more than six partners, provided they were outside a radius of fifty miles from Dublin[100].

The essence of banking is perhaps the acceptance from the public of deposits, repayable on demand or at short notice, which are then lent out, usually for short periods, at interest. The discounting of bills of exchange is largely concerned with substituting the short term finance of the discounter for the trade credit provided by the seller of goods. Thus, while 18th and 19th century banks were extensive discounters of bills of exchange, discounting was a separate business from banking. Bills of exchange were of very great importance in the 18th and 19th century economies of Britain and Ireland. As well as supplying finance, they also provided a convenient mechanism whereby commercial debts could be settled without the transmission of cash.

Hence, if by the phrase in Section 18 'discounters of money for shopkeepers selling by retail', we understand 'discounters of bills of exchange for shopkeepers selling by retail', the exclusion from the provisions of the Act of any business so acting could have done little other than have restricted the extent of its adoption. Any business which discounted a bill of exchange for a retailer would have been in danger of taking itself outside the ambit of the Act. For example, suppose a retailer sold goods on one month's credit to a local landowner and that the landowner accepted a bill, payable in one month's time for the amount due, drawn on him by the retailer. Suppose further that the retailer was indebted to his wholesaler. If he negotiated the bill to the wholesaler, at a discount, in payment, the wholesale firm would be in danger of losing any status it might have acquired under the Act.

The provisions of Section 18 thus further limited the types of business that could take advantage of the Act. It may also indirectly have militated against the achievement of its basic objective. An important form of business capital is working capital, of which the banks and discounters were major suppliers. Their willingness to provide this by dealing in bills of exchange may have been adversely affected by their need to consider whether or not they would be in breach of the section.

The Interpretation of the Act

Contemporaries believed that the Act was badly drafted and that consequently the benefits it appeared to offer might well be illusory. They were thus reluctant to use it[101].

We have seen several examples of where these doubts appear to have been justified. For instance, the question of what types of businesses fell within the definition contained in Section 1 was an important and troublesome matter. But none of these misgivings was tested in the courts[102], so that the confusions surrounding the meaning of the Act were never resolved. This lack of litigation, and of any serious attempt to amend the Act[103], may reflect its lack of importance to the Irish commercial community.

It is doubtful if the deficiencies in drafting are attributable to poor administration. It is true that the Act was a wartime measure, rushed through in the heady early days of Grattan's Parliament. But the dependent Irish Parliament had tried, without success, on previous occasions to obtain a similar measure by using the procedure prescribed by Poyning's Law. It was thus familiar enough with what was required. In addition John Foster[104], later to become speaker of the Irish House of Commons, who was responsible for guiding the measure through the Irish Parliament, had been careful to consult appropriate commercial interests when the bill was in its formative stage[105].

The difficulties in understanding the Act seem to have flown mainly from the general terms in which it was cast. It was a pioneering measure that was intended to embrace most of the Irish economy. It was but eighteen sections long. It is thus not surprising that it dealt with many matters of great practical significance and complexity in a superficial manner which left their precise treatment in doubt.

The Act contained much that was experimental. Many of the restrictions it embodied were not to be found in the equivalent French and American legislation. This also militated against clear and comprehensive drafting.

Conclusions

It seems to be accepted that it was the emergence of large scale industry which won the case for the introduction of general limited liability into Britain. The finance of such activity required the separation of ownership from management, so that the growing volume of savings could be tapped by industry and commerce. Such separation would not have been possible had not general limited liability been available.

However, a study of the circumstances surrounding the passing of the Act shows that the true reason for the original introduction of general limited liability into the United Kingdom was very different. Ireland had no large scale industry. It was a shortage of capital by small local businesses that led to the passing of the Act, in the hope that it would rectify this situation. The desire to stimulate the economy of Ireland was paramount and the passing of the Act caused little controversy and debate[106]. This contrasts sharply with the situation in Britain seventy years later when the pros and cons of the ethical and practical considerations surrounding the concept of general limited liability were endlessly argued[107]. It is only with hindsight that we can see that in Britain the question eventually became one of practical necessity (to have or not to have large scale industry) rather than an ethical one wherein the prejudice to creditors had to be given due weight. The different circumstances of the Irish economy made realism bite through the debate far earlier than in Britain.

The major argument against the introduction of general limited liability into mid-19th century Britain was that there was no need for it, as the rapidly expanding economy was generating a massive surplus of savings which eagerly sought out any investment opportunity. In such circumstances why should creditors be prejudiced, if no ultimate benefit would result to commerce and industry?[108]

But mid-19th century Britain was unusual in this respect. Almost without exception the shortage of capital which exercised the Irish had troubled the rulers of other countries. Like the Irish they believed that limited liability had a contribution to make to the solution of this problem. The consequence was that Britain was all but the last country to introduce general limited liability[109]. Against this background it is difficult to view the state of its law of business organisation as one of the reasons for the success of industrialisation in Britain.

By the mid-1880s, the introduction of general limited liability into Britain in 1855 had proved to be a success[110], as it had been in many other jurisdictions. The general experience was that the concept was one of the most useful and powerful commercial ideas. Yet it had failed in Ireland. But a study of the history of the Act shows that this failure was due, not to any inherent defect in the concept, but to the peculiar circumstances of Ireland. Firstly, the Irish economy was an impoverished subsistence economy, frequently disrupted by political turmoil. It offered general limited liability little scope to show its paces. Secondly, the constraints attaching to the grant of limited liability were onerous and ambiguous[111]. Any device, however powerful, can be rendered impotent if the circumstances surrounding its use are sufficiently restrictive.

A study of the Act also shows limited partnerships to be very different in their nature to normal partnerships. Limited partners are more akin to mere providers of capital, whose main desire is to purchase income, than they are to normal partners who contribute money, enterprise, work and energy to their business. The line between a limited partner and a lender who receives a high rate of interest on an investment is a fine one.

Finally, it seems fair to say that the concept of limited partnership has never been properly put to the test in the United Kingdom. The circumstances surrounding the operation of the Act, and of the Limited Partnership Act 1907, were not such as to enable the conclusion to be reached that carefully drawn statutes creating such institutions have no contribution to make to the conduct of modern industry and commerce. The professions, in particular, are currently troubled by huge claims for damages, founded on negligence. Insurance against these claims is proving to be costly and difficult to find. The way forward is seen as lying in a change from the partnership to the limited company form of organisation. However, the limited partnership may perhaps offer an alternative way of safeguarding the interests of most, but not all, of their members in a manner which is more in keeping with their traditions and ethos. All junior partners could perhaps be limited partners with the usual right to participate in the profits of the firm. Some way would clearly have to be found of allowing them a say in its management without losing their limited liability. Insofar as the limited partnership provides for the unlimited liability of general partners, it may possibly appeal to the public as being fair. It would surely help to preserve the incentive to careful work, which is one of the basic desiderata of an acceptable law of professional liability[112].

Footnotes

[1] BPP 1954, Vol. XXVII, p. 445. *First report of the Commissioners appointed to inquire and ascertain how far the Mercantile Laws in the different parts of the United Kingdom of Great Britain and Ireland may be advantageously assimilated and also whether any and what alterations and amendments should be made to the Law of Partnership as regards the question of the limited or unlimited responsibility of the partners.*

[2] ibid., p. 36. Opinion of Mr Kirkman Daniel Hodgson. '5thly This country is now, I believe, almost the only one in which this law of limited liability does not exist. It prevails in all those with which we have the most extended and important intercourse and this isolation acts very injuriously in many cases to the English merchant'.

[3] ibid., p. 108. Replies of James Clark (of the firm James Findlay and Co of Glasgow, Merchants, and a member of the Chamber of Commerce of Glasgow). 'Here we have in Ireland for seventy years the power of forming limited partnerships, and the actual results are given'.

[4] Moody, T. W. and Vaughan, W. E. (eds), *A New History of Ireland, Vol. IV, Eighteenth Century Ireland 1691–1800* (Oxford, 1986) and Cullen, L. M., *An Economic History of Ireland Since 1660* (London, 1972).

[5] 10 Hen VII C.9.

[6] 6 Geo 1, C.5.

[7] Cullen, L. M., 'Economic Development 1691–1750' and L. M. Cullen 'Economic Development 1750–1800' in T. W. Moody and W. E. Vaughan, op. cit., pp. 123–157, 159–193.

[8] Wall, M., 'Catholics in Economic Life' in L. M. Cullen, *The Formation of the Irish Economy* (Cork, 1969), pp. 37–51.

[9] McDowell, M. B., 'Colonial Nationalism and the Winning of Parliamentary Independence' in T. W. Moody and W. E. Vaughan, op. cit., pp. 196–233.

[10] Lecky, W. E. H., *Leaders of Public Opinion in Ireland* (London, 2nd ed, 1871). Essay on Grattan.

[11] McDowell, R. B., op. cit.

[12] Public Records Office of Northern Ireland (hereafter PRONI). The Foster/Massereene Archive. Ref. D.562, Document D562/8950. *Reasons in Favour of the Partnership Bill.* The reasons are written in James Corry's handwriting with emendations in Foster's. '4th. The necessity of providing full and profitable employ for our people before peace shall open the way for migration to America. If that peace arrives and industry shall not find an easy, sure and competent profit here... thousands will seek their fortune in a country to which they will be attracted from their many countrymen already settled there and which they will be taught to look upon as the rising empire of the world'.

[13] O'Brien, G., *The Economic History of Ireland in the 18th Century* (Dublin and London, 1918).

[14] Journal of the House of Commons of Ireland (hereafter *Commons Journals (Ireland)*). Vol. IV, 1731–1748 (4th–18th Dec. 1735); Vol. X, Part 1, 1779–1782 (29th May–2nd June 1780).

[15] 21 and 22 Geo 3, Cap 46 (Ireland) Sec 1. PRONI, *Reasons in Favour of the Partnership Bill, op.* cit.

[16] BPP 1854, op. cit., p. 102. Replies of Lawrence Robertson, Cashier of the Royal Bank of Scotland: '... but which at the same time could form no precedent for the application of similar measures in Great Britain, especially in the present era of super abundant capital for all legitimate purposes'.

[17] Cullen, L. M. (ed.), *The Formation of the Irish Economy* (Cork, 1969). Lee, J., 'Capital in the Irish Economy', pp. 53–63.

[18] BPP 1854, op. cit., p. 47. See also Ref. [47].

[19] BPP 1854, op. cit., p. 221. Replies of Mr Commissioner Fane, 4 Upper Brook Street, 20th February 1854, where he quotes 'the law as laid down by Chief Justice Eyre in 1793 in Waugh v Carver 2 H Blackstone 235'.

[20] 6 Geo 1 C.18.

[21] Dubois, A. B., *The English Business Company After the Bubble Act* (New York, 1938).

[22] Lehmann, K., *Die geschichtliche Entwicklung des Aktienrechts bis zum Code de Commerce* (Berlin, 1895), pp. 1–88.

[23] BPP 1854, op. cit., p. 90. Replies of David M. Laren, Merchant (selected by the Chamber of Commerce of Leith), 6th December 1853. 'As regards insurance, I believe that many of the companies in the country, by a special clause in their policies, limit their liability to the capital stock of the company, and in the city of Hamburg there are a great number of companies who have for a long period carried on extensive business, both in marine and also in fire insurance, the liability of each shareholder being limited to the amount of his subscription, and the system has been found most satisfactory to the shareholders as well as to the public. The policies of the Hamburg marine insurance companies are taken most readily in all parts of the North of Europe.'

[24] *The Dublin Journal*, No. 6169, May 25th to May 27th 1780, p. 2. 'Mr Foster moved for leave to bring in the Heads of a Bill for regulating partnerships, and promoting the Trade of the Kingdom. In prefacing his motion, he stated the nature of the anonymous companies in France and other countries.'

[25] 26 Geo 3, C.34 (Ireland).

[26] Lindsay and Company v Loughead [1847] Exch.Pleas (Irl) p. 286.

[27] 7 Edw 7 C.24.

[28] 18 and 19 Vict, C. 133 (Limited Liability Act).

[29] 7 Edw 7 C.50.

[30] Scammell, E. M. and Vanson Banks, R. C., *Lindlay on the Law of Partnership* (London, 14th ed, 1979).

[31] Hesketh, G., *Underhill's Law of Partnership* (London, 7th ed, 1958), p. 81. Osborn, P. G. *A Concise Law Dictionary*, (London, 1964), p. 81.

[32] 53 and 54 Vict, C.39. Sec 24(1); Sec 24(5); Sec 33(1).

[33] BPP 1854, op. cit., p. 70. Replies of William Henry Cotterill (Solicitor, Throgmorton Street, London), 19th November 1853.

[34] ibid., p. 7.

[35] The danger here envisaged would be lessened if the lender of long term loan capital was a deferred creditor.

[36] BPP 1854, op. cit.

[37] Mill, J. S., *Principles of Political Economy*, Book V, ed. D. Winch (Harmondsworth, 1970), pp. 258–270.

[38] BPP 1854, op. cit., p. 34. Opinion of Mr Anderson.

[39] ibid., p. 142. Report of the Law of Partnership. Prepared by the Belfast Chamber of Commerce. Published in the Belfast Newsletter of Friday, April 8th, 1853 and annexed to the above printed reply of James Kennedy.

[40] PRONI, op. cit. Document D562/8951.

[41] BPP 1854, op. cit., p. 188. Replies of Richard Miller, Merchant, Leith, 21st January 1854.

[42] ibid.

[43] ibid., p. 1.

[44] Cullen, L. M. (ed.), *The Formation of the Irish Economy* (Cork, 1969). Drake, M., 'Population Growth and the Irish Economy', pp. 65–76.

[45] Daly, E. M., *The Famine in Ireland* (Dundalk, 1986).

[46] Woodham-Smith, C., *The Great Hunger, Ireland 1845–9* (London, 1962).

[47] Green, E. R. R., in *The Formation of the Irish Economy.* 'Industrial decline in the Nineteenth Century', pp. 89–100.

[48] ibid., Wall, M., 'Catholics in Economic Life', pp. 37–52.

[49] Bolton, G. C., 'Some British Reactions to the Irish Act of Union', *Economic History Review*, 18 (1965), p. 367.

[50] Bolton, G. C., *The Passing of the Irish Act of Union* (Oxford, 1966), p. 218.

[51] Green, E. R. R., op. cit.

[52] Bolton, G. C., *The Passing of the Irish Act of Union*, p. 218. Also Moody, T. W. and Vaughan, W. E., op. cit., McDowell R. B., 'The Age of the United Irishmen. Revolution and the Union. 1794/1800', pp. 339–370.

[53] *The Formation of the Irish Economy*, Green, E. R. R., op. cit.

[54] *The Formation of the Irish Economy*, Crawford, W. H., 'The Rise of the Linen Industry', pp. 23–36.

[55] BPP 1854, op. cit., p. 155. Replies of John Malcolm Ludlow, Barrister at Law, 3 Old Square, Lincoln's Inn. December 1853.

[56] Cullen, L. M., *An Economic History of Ireland Since 1660* (London, 1972).

[57] PRONI, Document D562/8950. 'It is to be expected that such subscriptions will be made principally for manufacture, collieries, mines and, above all, for the fisheries which have been hitherto neglected most probably for want of such a bill. I do not believe that many such partnerships will be made for the purpose of commerce'.

[58] O'Brien, G., *The Economic History of Ireland in the 18th Century*, ch. 17, pp. 167–172.

[59] O'Brien, G., *The Economic History of Ireland from the Union to the Famine* (London, 1921), ch. 9, p. 288.

[60] ibid.

[61] Pakenham, T., *The Year of Liberty. The Great Irish Rebellion of 1798* (St Albans, 1972).

[62] Beckett, J. C., *The Making of Modern Ireland 1603–1923* (London, 1966), pp. 176–179.

[63] ibid. Chapter 13, pp. 246–267.

[64] BPP 1854, op. cit. See the answers to question 23 ('Are you aware that in Ireland, in the year 1782, an Act of Parliament, 21 and 22 Geo 3, C.46, was passed allowing partnership with limited liability under restrictions? Do you know to any, and what extent, this statute has been put in operation, and whether any partnerships have been established, or now exist under the provisions of the statute? And generally what has been the effect and operation of the Statute in Ireland?') of the questions circulated by the Royal Mercantile Law Commission in the United Kingdom, the British colonies in North America and the United States of America. See also McKenna, P. J., 'On partnerships with limited liability', *Dublin Statistical Society*, 1854, pp. 137–145.

[65] BPP 1854, op. cit., pp. 141–142. Report on the Law of Partnership, prepared by the Belfast Chamber of Commerce (published in the Belfast Newsletter of Friday, 8th April 1853).

[66] ibid., p. 136. Replies of James Kennedy (of the firm of J. and T. Kennedy of Belfast, Muslin Manufacturers and Vice President of, and selected by, the Chamber of Commerce of Belfast). 'The Irish Act passed in 1782 is a dead letter. Its provisions are so loose and have been interpreted so illiberally by our courts that no lawyer would advise his client to take advantage of the Act'.

[67] Pimm, J., 'On Partnerships of Limited Liability', *Dublin Statistical Society*, 1852, pp. 2–16.

[68] BPP 1854, op. cit., see Ref. [64].

[69] BPP 1854, op. cit., p. 239. Replies of Thomas Baker (of the firm of Messers Baker, Ruch and Jennings, Solicitors, Lime Street, London): '3rd. So great is the demand for limited liability that companies are frequently constituted in Paris and the United States in order that they may obtain the security which in this respect the laws of these countries afford. When these companies are formed in Paris they pay a heavy duty to the French Government. The duty assessed upon one company of which my firm were the solicitors amounted to £750'.

[70] BPP 1854, op. cit., p. 198. Replies of John Slogg, Merchant (selected by the Chamber of Commerce of Manchester), Manchester, 30th November 1853. 'Many firms "en commandite" were formed in Constantinople and sent one of the partners to England . . . '.

[71] It may have been the case that part of the failure of the Act can be attributed to the greater ease with which Joint Stock Companies could obtain limited liability in Ireland, as compared to England. See BPP 1854, op. cit., p. 229. Replies of G. K. Rickards, House of Commons, 31st December 1853. 'It was stated by an experienced solicitor, Mr J. Duncan, in his evidence before the Select Committee of the House of Commons on the Law of Partnership in 1851, that "a practice at that time existed of giving limited liability to almost every Joint Stock Company seeking to carry out an object connected with Ireland where it would not be conceded for a similar object in England or Scotland".' No further evidence on this point has been discovered.

[72] *Dublin Evening Post*. No. 610, Thursday 27th December 1781, p. 3. 'In a commercial light scarce anything that has yet been thought of will contribute more to ensure the effects of the late extension of our trade than the bill brought into the House by Mr Foster for the regulation of co-partnerships. As that matter at present stands any connection however slight in business renders each person in the firm liable to the debts of the whole—so that a person who has only a 16th share or less in any partnership, in case of an accident, is liable to make up the deficiencies of the whole business. This was most sadly experienced in Fordyce's failure when one of the partners, who had but an inconsiderable share in the house, not only lost the capital embarked in that line but was also stripped of a private fortune of some thousand pounds a year and his family turned out to beggary and want to make good debts contracted by Fordyce though without his knowledge or approbation. These may safely now subscribe any sums they think proper for establishing a new manufacture, without a possibility of losing more than the original subscription. To merchants and people in trade it will be an inconceivable benefit, as all the horrors that hang over partnership will be removed and in place of distrust and disquiet confidence and enterprise will be diffused through the land'.

[73] *Commons Journal* (Ireland). Vol. X (Oct 12th 1779 to July 27th 1782), February 18th 1782, p. 303. 'A petition of the Merchants and Traders whose names are thereunto subscribed, in behalf of themselves and the other Merchants and Traders of the City of Dublin was presented to the House and read, setting forth, that the petitioners have observed in the private votes that heads of a bill are brought into the House to promote Trade and Manufacture by regulating and encouraging partnerships and the same have been by order printed; that the petitioners have read the said Heads of a Bill, and humbly apprehend that their being passed into Law will be of very great utility and advantage and tend to promote the trade and commerce of the Kingdom: and therefore praying the House to take the same into consideration; and pass the same in such manner as shall seem meet'. The Woollen Manufacturers also presented a petition in favour of the Bill. *The Dublin Journal*, No. 6444, from Tuesday, February 19th 1782 to Thursday February 21 1782, p. 2.

[74] BPP 1854, op. cit. Replies by persons in the United Kingdom to a series of questions in English. No. 4, William Cotton, Director and late Governor of the Bank of England. 11th November 1853.

[75] ibid., p. 28. The opinion of Mr Bramwell.

[76] Pimm, J., op. cit., pp. 2–16.

[77] Mill, J. S., op. cit., p. 258. 'In England it is already a serious discouragement that differences among partners are, practically speaking, only capable of adjudication by the Court of Chancery; which is often worse than placing such questions out of the pale of all law. . . .'

[78] Cullen, L. M., *An Economic History of Ireland Since 1660*, pp. 130–131.

[79] BPP 1854, op. cit., p. 108. Replies of James Clerk, p. 127. Replies of Thomas Matthias Weguelin (Deputy Governor of the Bank of England), 23 December 1853.

[80] ibid., p. 155. Replies of John Malcolm Ludlow, Barrister at Law, 3 Old Square, Lincoln's Inn, December 1853.

[81] PRONI, op. cit., Document D562/8947. A letter from Mr R. Mark at Limerick to John Foster giving his father's views on the Partnership Bill and on a Bill granting further relief to the Roman Catholics, January 25th 1782. 'My father read the Heads of a bill thou were so kind to enclose him. He sees no occasion to limit the number of years for a partnership by Act of Parliament as it would be 7 years before an extensive trade could be well fixed . . .'.

[82] BPP 1854, op. cit. Replies of John Hollams (of the firm Messers Morton, Thomas and Hollams, Solicitors, Mincing Lane, London), 3rd February 1854.

[83] ibid., p. 205. Replies of H. Bellenden Ker, Lincoln's Inn. 4th February 1854.

[84] Mill, J. S., op. cit., p. 267. Also BPP 1854, op. cit. Replies of William Ellis, Manager of the Indemnity Marine Assurance Company, 16th December 1853.

[85] BPP 1854, op. cit., p. 219. Replies of C. Robertson, Merchant (selected by the Chamber of Commerce of Liverpool), 16th February 1854.

[86] At the end of the third quarter of 1988, £50,000 in 1782 prices would have had a value of approximately £1,500,000. £1,000 in 1782 prices would have had a value of almost £30,000. See *The Economist*, 13th July 1974, 'Back to an Age of Falling Prices?' and *Economic Trends* (1989) (HMSO), Table 25, p. 128.

[87] Shannon, H. A. L., 'The Coming of General Limited Liability', *Economic History*, January 1931, p. 287. 'It was the railways that won the acceptance of general limited liability.'

[88] BPP 1854, op. cit., p. 134. Replies of William Brown, MP, Richmond Hill, near Liverpool, 16th November 1853. 'The time was, and may exist to some extent now, that men, even of moderate property in Ireland, thought that trade degraded a gentleman, and which no doubt injures Irish credit.'

[89] Paish, F. W., *Business Finance* (London, 4th ed, 1968), p. 64.

[90] BPP 1854, op. cit., p. 96. Replies of Lord Overstone and William G. Prescott, Banker. 28th December 1853.

[91] ibid., p. 54. Appendix to report. Questions circulated by the Royal Mercantile Law Commission in the United Kingdom, the British Colonies in North America, and the United States of America. Question 14: 'Are you of opinion that the liability of limited partners should be limited to the original sum advanced or undertaken to be advanced by them? Or should it also include profits or dividends withdrawn or realised by such limited partners during the partnership, or during a given number of years, say six years? Or to what extent do you think the limit of liability should be fixed? Would you make any special provision as to liquidating the liabilities of such partnerships in case they become bankrupt or insolvent?'

[92] ibid., pp. 78, 142, 161, 191.

[93] ibid. Leone Levi, Lecturer in Law at Kings College; London; Edward Lake Hesp, Solicitor (selected by the Chamber of Commerce of Huddersfield); William Hawes (Chairman of the Committee of Merchants and Traders for the Amendment of the Law of Debtor and Creditor, London).

[94] ibid., pp. 144–156. Replies of John Malcolm Ludlow, Barrister at Law, 3 Old Square, Lincoln's Inn, December 1853.

[95] ibid., p. 122. Replies of John Gellibrand Hubbard (Governor of the Bank of England), 16 December 1853.

[96] ibid., p. 252. Replies of E. H. Gillilan (of the firm of Bird, Gillilan and Co of Liverpool and New York), January 1854.

[97] ibid., p. 90. Replies of David M'Laren, Merchant (selected by the Chamber of Commerce of Leith), 6th December 1853.

[98] Beckett, J. C., op. cit., pp. 241–245.

[99] Cullen, L. M., *An Economic History of Ireland since 1660*, p. 125.

[100] ibid.

[101] BPP 1854, op. cit., p. 136. Replies of James Kennedy (of the firm J. and T. Kennedy of Belfast, Muslin Manufacturers, and a Vice President of, and selected by, the Chamber of Commerce of Belfast).

[102] The case of Lindsay and Company v Loughead [1847] Exch. Pleas (Irl), p. 286, which deals with the interpretation of Section 11, seems to be the only reported case on the Act.

[103] The Act was amended by the Statute 26 Geo 3 C.34 (Ireland). However the amending Statute deals solely with the matters of procedure contained in Section 11 of the Act.

[104] Malcomson, A. P. W., *John Foster. The Politics of the Anglo-Irish Ascendancy* (Oxford, 1978).

[105] PRONI, op. cit. In particular documents D562/8938, D562/8942, D562/8943, D562/8944, D562/8945, D562/8947, D562/8949, D562/8950 and D562/8951.

[106] *The Dublin Journal*, *Dublin Evening Post*, *The Public Register or Freeman's Journal*, 1780–1782.

[107] BPP 1854, op. cit.

[108] ibid.

[109] See the detailed comparative study of the partnership laws of over 30 jurisdictions made by Leone Levi: Levi, L. *Commercial Law, its Principles and Administration* (London, 1850) I, pp. 73–167.

[110] Shannon, H. A., 'The First Five Thousand Limited Companies and Their Duration', *Economic History*, January 1932, pp. 396–419. Also Hudson, J. 'The Limited Liability Company: Success, Failure and Future' *Royal Bank of Scotland Review*, No. 161, March 1989, pp. 26–39.

[111] BPP 1854, op. cit., p. 175. Replies of John Howell (of the firm of Ellis, Everington and Co, Warehousemen, London), Stratham, 16th January 1854. '23 Yes. But Irish Acts of Parliament of the date of that referred to were too generally clumsy and ineffective. The Irish legislature hampered the law with many conditions. I know of a few concerns successfully carried out under the law, but generally it has been but little used. An intelligent English solicitor, practicing in Dublin, has however assured me that the principle would work incalculable good in Ireland under a more wisely framed statute'.

[112] Jackson, R., 'Professional Liability', *Journal of the Royal Society of Arts*, July 1988, pp. 536–546.

Appendix 1

Return from the Register of Deeds Office, Ireland

Abstract of Partnerships registered under Irish Statute 21 and 22 Geo.3, C.46 ('Anonymous Partnerships Act')

Year	No. of Partnerships Registered in Each Year	No. of Acting Partners	Total Capital Subscribed by Acting Partners			No. of Anonymous Partners	Total Capital Subscribed by Anonymous Partners		
			£	s	d		£	s	d
1782	2	3	750	0	0	6	7,250	0	0
1783	3	3	3,400	0	0	3	2,400	0	0
1784	3	5	4,500	0	0	4	8,000	0	0
1785	3	3	1,100	0	0	15	4,200	0	0
1786	6	11	3,300	0	0	20	10,300	0	0
1787	6	7	3,213	6	8	16	12,016	13	4
1788	5	5	3,833	6	8	8	5,466	13	4
1789	5	8	10,666	13	4	9	10,333	6	8
1790	6	9	5,950	0	0	15	9,850	0	0
1791	12	15	6,283	6	8	46	21,766	13	4
1792	13	13	10,039	0	0	46	31,390	0	0
1793	6	8	4,333	6	8	12	8,666	13	4
1794	7	9	3,583	6	8	9	3,910	13	4
1795	6	8	12,334	17	11	6	6,134	17	11
1796	8	13	9,100	0	0	20	10,200	0	0
1797	7	8	6,680	0	0	11	12,800	0	0
1798	5	6	4,200	0	0	7	5,500	0	0
1799	6	7	10,900	0	0	22	37,400	0	0
1800	16	18	7,934	10	0	26	23,134	10	0
1801	11	15	10,566	13	4	23	15,033	6	8
1802	26	30	59,925	0	0	61	121,675	0	0
1803	17	20	17,183	6	8	23	23,522	13	4
1804	16	21	19,733	6	8	26	28,979	12	1
1805	18	22	36,450	0	0	35	45,100	0	0
1806	19	24	31,501	17	0	70	52,974	0	0
1807	20	28	59,916	13	4	42	58,683	6	8
1808	15	19	18,800	0	0	21	18,950	0	0
1809	19	23	47,800	0	0	34	75,200	0	0
1810	14	19	48,775	0	0	33	64,875	0	0
1811	14	20	29,233	6	8	26	44,116	13	4
1812	13	17	24,900	0	0	16	32,850	0	0
1813	19	31	59,813	6	4	41	61,119	19	8
1814	13	19	27,700	0	0	25	32,533	6	8
1815	10	15	28,900	0	0	16	27,500	0	0
1816	9	13	15,350	0	0	26	30,600	0	0
1817	5	7	4,900	0	0	8	10,200	0	0
1818	5	6	7,353	6	8	5	5,876	13	4
1819	8	9	19,920	0	0	13	46,880	0	0
1820	2	3	3,575	6	11	2	1,500	0	0
1821	4	5	3,100	0	0	6	3,700	0	0
1822	5	7	6,800	0	0	11	6,270	0	0
1823	6	6	7,725	0	0	48	26,875	0	0
1824	10	15	14,115	0	0	19	18,440	0	0
1825	6	7	25,650	0	0	51	36,750	0	0
1826	2	3	1,500	0	0	3	1,500	0	0
1827	4	5	2,133	6	8	5	4,466	13	4
1828	10	13	9,400	0	0	16	14,100	0	0
1829	5	6	5,000	0	0	7	8,600	0	0
1830	4	8	4,700	0	0	4	5,400	0	0
1831	1	2	1,500	0	0	4	3,500	0	0
1832	None registered								
1833	7	9	15,666	13	4	22	15,033	6	8

Continued overleaf

Continued from overleaf

Year	No. of Partnerships Registered in Each Year	No. of Acting Partners	Total Capital Subscribed by Acting Partners £	s	d	No. of Anonymous Partners	Total Capital Subscribed by Anonymous Partners £	s	d
1834	4	5	2,700	0	0	6	19,000	0	0
1835	3	3	2,833	6	8	5	5,166	13	4
1836	6	9	7,550	0	0	16	6,650	0	0
1837	4	7	12,700	0	0	4	11,100	0	0
1838	6	8	7,416	13	4	8	15,083	0	8
1839	5	7	7,500	0	0	6	5,600	0	0
1840	1	1	—			2	2,000	0	0
1841	2	2	—			4	2,000	0	0
1842	2	2	550	0	0	5	3,700	0	0
1843	None registered								
1844	1	1	1,000	0	0	1	500	0	0
1845	1	1	400	0	0	4	1,600	0	0
1846 1847 1848	None registered								
1849	3	6	900	0	0	16	8,600	0	0
1850	2	2	1,200	0	0	2	1,000	0	0
1851	2	3	3,250	0	0	2	2,250	0	0
1852	2	3	1,400	0	0	5	2,600	0	0
1853	2	2	8,500	0	0	*—	—		
1854 to 6th May	1	1	—			1	1,000	0	0

*'Electric Telegraph Company', as many anonymous as may sign the deed of partnership.

*Particulars of each Partnership Registered under Irish Statute 21 and 22 Geo.3. C.46, commencing 1st January 1829 and ending 6th May 1854**

Year	No. of Partnerships Registered in Each Year	No. of Acting Partners	Total Capital Subscribed by Acting Partners £	s	d	No. of Anonymous Partners	Total Capital Subscribed by Anonymous Partners £	s	d
1829	1	1	—			1	1,000	0	0
	2	1	1,000	0	0	1	600	0	0
	3	1	—			2	1,000	0	0
	4	2	4,000	0	0	2	5,000	0	0
	5	1	—			1	1,000	0	0
Total	5	6	5,000	0	0	7	8,600	0	0
1830	1	4	200	0	0	1	900	0	0
	2	1	500	0	0	1	3,000	0	0
	3	1	3,000	0	0	1	1,000	0	0
	4	2	1,000	0	0	1	500	0	0
Total	4	8	4,700	0	0	4	5,400	0	0
1831	1	2	1,500	0	0	4	3,500	0	0
1832	None registered								
1833	1	1	—			1	2,000	0	0
	2	1	5,000	0	0	1	5,000	0	0
	3	1	1,500	0	0	3	2,000	0	0
	4	3	5,666	13	4	1	2,333	6	8
	5	1	500	0	0	1	500	0	0
	6	1	1,500	0	0	14	1,700	0	0

Continued opposite

Continued

Year	No. of Partnerships Registered in Each Year	No. of Acting Partners	Total Capital Subscribed by Acting Partners £	s	d	No. of Anonymous Partners	Total Capital Subscribed by Anonymous Partners £	s	d
	7	1	1,500	0	0	1	1,500	0	0
Total	7	9	15,666	13	4	22	15,033	6	8
1834	1	1		—		1	4,000	0	0
	2	1	700	0	0	1	1,000	0	0
	3	2		—		2	10,000	0	0
	4	1	2,000	0	0	2	4,000	0	0
Total	4	5	2,700	0	0	6	19,000	0	0
1835	1	1	333	6	8	2	666	13	4
	2	1	2,000	0	0	2	4,000	0	0
	3	1	500	0	0	1	500	0	0
Total	3	3	2,833	6	8	5	5,166	13	4
1836	1	1	1,000	0	0	1	1,000	0	0
	2	2	2,500	0	0	1	1,000	0	0
	3	2	1,250	0	0	1	750	0	0
	4	1	1,000	0	0	2	1,000	0	0
	5	1		—		10	2,000	0	0
	6	2	1,800	0	0	1	900	0	0
Total	6	9	7,550	0	0	16	6,650	0	0
1837	1	1	2,000	0	0	1	2,000	0	0
	2	2	700	0	0	1	1,100	0	0
	3	2	5,000	0	0	1	3,000	0	0
	4	2	5,000	0	0	1	5,000	0	0
Total	4	7	12,700	0	0	4	11,100	0	0
1838	1	1		—		1	4,000	0	0
	2	2	666	13	4	1	333	6	8
	3	1	2,500	0	0	1	2,500	0	0
	4	1		—		2	1,500	0	0
	5	1	3,750	0	0	1	3,750	0	0
	6	2	500	0	0	2	3,000	0	0
Total	6	8	7,416	13	4	8	15,083	6	8
1839	1	1	800	0	0	1	800	0	0
	2	2	5,000	0	0	1	2,500	0	0
	3	1	500	0	0	2	500	0	0
	4	1	200	0	0	1	800	0	0
	5	2	1,000	0	0	1	1,000	0	0
Total	5	7	7,500	0	0	6	5,600	0	0
1840	1	1		—		2	2,000	0	0
1841	1	1		—		2	1,000	0	0
	2	1		—		2	1,000	0	0
Total	2	2		—		4	2,000	0	0
1842	1	1	550	0	0	4	2,200	0	0
	2	1		—		1	1,500	0	0
Total	2	2	550	0	0	5	3,700	0	0
1843	None registered								
1844	1	1	1,000	0	0	1	500	0	0
1845	1	1	400	0	0	4	1,600	0	0
1846 1847 1848	None registered								

Continued overleaf

Continued

Year	No. of Partnerships Registered in Each Year	No. of Acting Partners	Total Capital Subscribed by Acting Partners			No. of Anonymous Partners	Total Capital Subscribed by Anonymous Partners		
			£	s	d		£	s	d
1849	1	2	—			4	2,000	0	0
	2	1	400	0	0	4	1,600	0	0
	3	3	500	0	0	8	5,000	0	0
Total	3	6	900	0	0	16	8,600	0	0
1850	1	1	700	0	0	1	500	0	0
	2	1	500	0	0	1	500	0	0
Total	2	2	1,200	0	0	2	1,000	0	0
1851	1	1	1,250	0	0	1	1,250	0	0
	2	2	2,000	0	0	1	1,000	0	0
Total	2	3	3,250	0	0	2	2,250	0	0
1852	1	2	1,000	0	0	1	1,000	0	0
	2	1	400	0	0	4	1,600	0	0
Total	2	3	1,400	0	0	5	2,600	0	0
1853	1	1	500	0	0	1	1,500	0	0
	2†	1	8,000	0	0	As many as may sign the deed of partnership			
Total	2	2	8,500	0	0	—	—		
1854 to May 6	1	1	—			1	1,000	0	0

*Similar particulars of each partnership registered under the 'Anonymous Partnerships Act', from its commencement to the end of the year 1828, were furnished by the Registrar together with the foregoing abstract, but as they are of considerable length, the particulars of the more recent partnerships only are given here.

†Electric Telegraph Company, £1 shares, Acting Partner has taken 8,000.

Morgan O'Connell,
Registrar

May 6, 1854

Statistical Summary
Partnerships Formed in the Period 1782–1854

Total number of partnerships in the period 1782–1854	=		509
Total number of acting partners	=	669	
Total number of anonymous partners	=	1,130	
Total number of partners	=		1,799
Total capital subscribed by acting partners (rounded to nearest £ for each year)			£839,587
Total capital subscribed by anonymous partners (rounded to nearest £ for each year)			£1,261,377
Total capital			£2,100,964
Average capital per partnership	=		£4,128
Average capital subscribed by acting partners	=		£1,255
Average capital subscribed by anonymous partners	=		£1,116
Average capital subscribed per partner	=		£1,168

Accounting and Business Research, Vol. 21, No. 81, pp. 35–40, 1990

Determining Meaningful Sales Relational (Mix) Variances

Brian Gibson*

Abstract—Further separation of the volume variance component of a multi-product firm's revenue variance into mix and quantity variances is regularly advocated by management accounting educators. Techniques used to achieve this separation are generally an extension of the analytical techniques used in the traditional flexible budget 'step-down' approach to variance determination. The analysis in this paper suggests that such an extension in most multi-product situations is inappropriate and generates useless and misleading results. Specific situations in which relational (in lieu of mix) variances may be appropriate do exist and applicable techniques are developed.

Introduction

Accounting variance analysis is concerned with identifying differences between financial measures of the planned and actual outcomes of a firm's activities. Analytical techniques are utilised to facilitate the further separation of identified differences into variances associated with particular variables. Mathematical properties inherent in most variance analysis models appear, unfortunately, to have induced the calculation of useless and possibly misleading information. An example, discussed in this paper, is the further separation of the sales volume variance into mix and quantity variances. The paper commences by examining the underlying reality represented in general revenue variance analysis models. The lack of any premise for determining a sales mix variance in most situations is then analysed. Finally, situations are presented in which it might be appropriate to ascertain relational (in lieu of mix) variances.

The structure of a general revenue variance analysis model

The traditional microeconomic cost-volume-profit model of a firm suggests that, for a specified period, profit (π) is a function of the physical volume of product sold (X), the average price received for each unit of product (P), the average per unit variable costs of producing each unit sold (V), and the fixed costs of the period (F).

Prior to the commencement of a specified planning period, management[1] estimates a measure for each of these variables. After the end of the specified planning period, an actual measure for each of the variables is ascertained. Variance analysis seeks, initially, to identify elements contributing to the overall difference between planned and actual profit. For a firm with n products, the total profit variance may be expressed as:

$$\pi^a - \pi^p = \left[\sum_{i=1}^{n} X_i^a P_i^a - \sum_{i=1}^{n} X_i^p P_i^p\right] + \left[\sum_{i=1}^{n} X_i^p V_i^p - \sum_{i=1}^{n} X_i^a V_i^a\right] + [F^p - F^a] \quad (1)$$

where the superscripts a and p denote actual and planned measures.

This particular representation of the profit variance model identifies the extent to which the total profit variance is affected by differences in: the total revenue; the total variable costs; and the total fixed costs of the firm. Each of the elements on the right hand side of equation (1) may be further separated to identify the extent to which variations in specific variables contribute to the total difference.

The remainder of this paper concentrates only on variances associated with two specific variables, the physical sales volume (X) and the associated average sales price (P) as represented by the first element on the right hand side of equation (1). This concentration on the revenue variance is made only for the purpose of simplification. It is not intended

---

*The author is a lecturer in the Department of Commerce, University of Newcastle, Australia. He wishes to thank Frank Clarke of the University of Newcastle, Don Egginton of the University of Bristol, and two anonymous referees for their useful comments on earlier drafts of this paper.

[1] The expression 'management' is used throughout this paper as a generic term for those people in an organisation who are involved in the process of specifying expected (planned) performance and evaluating subsequent actual performance.

Table 1
Meaningful Separations of the Total Revenue Variance

Product	*Price Variance*	+	*Volume Variance*	=	*Revenue Variance*
1	$X_1^a(P_1^a - P_1^p)$	+	$P_1^p(X_1^a - X_1^p)$	=	$X_1^a P_1^a - X_1^p P_1^p$
	+		+		+
.	.	+	.	=	.
.	.	+	.	=	.
.	.	+	.	=	.
	+		+		+
n	$X_n^a(P_n^a - P_n^p)$	+	$P_n^p(X_n^a - X_n^p)$	=	$X_n^a P_n^a - X_n^p P_n^p$
	=		=		=
	$\sum_{i=1}^{n} X_i^a(P_i^a - P_i^p)$	+	$\sum_{i=1}^{n} P_i^p(X_i^a - X_i^p)$	=	$\sum_{i=1}^{n} X_i^a P_i^a - \sum_{i=1}^{n} X_i^p P_i^p$

to imply that costs are not worthy of further investigation. Nor is there any intention to suggest that differences in volume should only be analysed in conjunction with price.[2]

In a multi-product firm where there is no specified relationship between the sales volume of individual products,[3] management presumably plans total revenue using a separate estimate of physical volume and expected average price for each product. A useful separation of the total revenue variance is likely, therefore, to be an identification of the revenue variance attributable to each product. If corresponding actual measures for volume and price are available, the revenue variance for each individual product can be further separated into a price variance and a volume variance. The total revenue variance may also be separated into a total price variance and a total volume variance by summing the individual product price and volume variances. Table 1 summarises the relationship between the preceding individual and total separations which are the basis of the multi-product revenue variance model.

The outcomes of the revenue variance model summarised in Table 1 are related to the variables and relationships considered in the planning process. Management expects a particular physical volume of each product to be sold at a particular average price. Assuming that the recording of actual results allows determination of comparable measures, outcomes of the variance model direct attention to differences related to individual product price and volume as considered in the planning process. Totals of the price and volume variances over all products are identified: only, however, by aggregating other information generated by the model. Generally, this is as far as a meaningful separation of the total revenue variance should be taken. To proceed beyond this level of analysis is to introduce variables and relationships not considered in the planning process.

Simplifying procedural steps may be taken in applying the preceding revenue variance model. Ascertaining a flexible budget for each product is a potentially beneficial procedural step in determining separations. For an individual product, determining the price variance is equivalent to deducting flexible budget revenue [$X_i^a P_i^p$] from actual revenue [$X_i^a P_i^a$]. Similarly, determining the volume variance is equivalent to deducting planned revenue [$X_i^p P_i^p$] from flexible budget revenue. Applying this procedure in the revenue variance model still does not require separate totals for the planned, actual and flexible budgets. In practical applications, however, totals are likely to be determined. A residual effect of the additional computations of totals is the possibility of determining weighted average prices. Total price, volume and revenue variances may then be ascertained simply by using the totals and averages. The nature of these alternative procedural steps is summarised in Table 2.

Reliance only on totals is not in accord with the basic premises of the revenue variance model. Emphasis in the planning process is on individual volume and price for each product. Totals are nothing more than a residual. So, too, should totals of variances have residual status. Concentration on the alternative procedures summarised in Table 2 does, however, result in totals which may be interpreted in the same way as those determined by applying the procedures outlined in Table 1. This is not the case when concentration on totals is used to achieve further separations of the volume variance.

---

[2] Comments in respect of revenue variances are equally applicable when contribution margin is used rather than price. Concentration on price only enables the analysis to proceed without the complication of also having to consider the effects of cost variances.

[3] Situations in which there is a specified relationship between the sales volume of individual products are considered later.

Table 2
Alternative Procedural Steps in Revenue Variance Analysis

Product	*Actual Outcomes*			*Flexible Budget*			*Planned Outcomes*		
1	X_1^a	P_1^a	$X_1^a P_1^a$	X_1^a	P_1^p	$X_1^a P_i^p$	X_1^p	P_1^p	$X_1^p P_1^p$
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
n	X_n^a	P_n^a	$X_n^a P_n^a$	X_n^a	P_n^p	$X_n^a P_n^p$	X_n^p	P_n^p	$X_n^p P_n^p$
Total	$\sum_{i=1}^{n} X_i^a$		$\sum_{i=1}^{n} X_i^a P_i^a$	$\sum_{i=1}^{n} X_i^a$		$\sum_{i=1}^{n} X_i^a P_i^p$	$\sum_{i=1}^{n} X_i^p$		$\sum_{i=1}^{n} X_i^p P_i^p$

Residual Computations:
Average:

$$P_{\bar a}^a = \left[\frac{\sum_{i=1}^{n} X_i^a P_i^a}{\sum_{i=1}^{n} X_i^a}\right] \qquad P_{\bar a}^p = \left[\frac{\sum_{i=1}^{n} X_i^a P_i^p}{\sum_{i=1}^{n} X_i^a}\right] \qquad P_{\bar p}^p = \left[\frac{\sum_{i=1}^{n} X_i^p P_i^p}{\sum_{i=1}^{n} X_i^p}\right]$$

Total Price Variance: $P_{\bar a}^a \sum_{i=1}^{n} X_i^a - P_{\bar a}^p \sum_{i=1}^{n} X_i^a$

Total Volume Variance: $P_{\bar a}^p \sum_{i=1}^{n} X_i^a - P_{\bar p}^p \sum_{i=1}^{n} X_i^p$

The usefulness of mix and quantity variances

It is often suggested[4] that the total volume variance in a multi-product firm can be further separated into a mix variance and a quantity variance. Bastable and Bao (1988) outline the common approaches used to achieve this further separation. Generally these approaches rely on an apportionment of totals using the averages developed in Table 2. Implied in the procedure is the development of a planned mix flexible budget. The complete analytical manipulation required is not developed here; rather the underlying procedural steps are summarised in Table 3.

---

[4] Kaplan and Atkinson (1989), Hirsch (1988), Rickets and Gray (1988), and Wilson and Chua (1988) provide recent examples.

Table 3
Traditional Further Separations of the Volume Variance

Total Mix Variance: $\sum_{i=1}^{n} X_i^a [P_{\bar a}^p - P_{\bar p}^p]$

Total Quantity Variance: $P_{\bar p}^p \left[\sum_{i=1}^{n} X_i^a - \sum_{i=1}^{n} X_i^p\right]$

Implied Procedural Computations:

Product	*Flexible Budget*			*Planned 'Mix' Flexible Budget*			*Planned Outcomes*		
1	X_1^a	P_1^p	$X_1^a P_1^p$	$X_1^{a'}$ *	P_1^p	$X_1^{a'} P_1^p$	X_1^p	P_1^p	$X_1^p P_1^p$
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
n	X_n^a	P_n^p	$X_n^a P_n^p$	$X_n^{a'}$	P_n^p	$X_n^{a'} P_n^p$	X_n^p	P_n^p	$X_n^p P_n^p$
Total	$\sum_{i=1}^{n} X_i^a$		$\sum_{i=1}^{n} X_i^a P_i^p$	$\sum_{i=1}^{n} X_i^a$		$\sum_{i=1}^{n} X_i^{a'} P_i^p$	$\sum_{i=1}^{n} X_i^p$		$\sum_{i=1}^{n} X_i^p P_i^p$
Average		$P_{\bar a}^p$			$P_{\bar p}^p$			$P_{\bar p}^p$	

$$*X_i^{a'} = \left[\frac{X_i^p}{\sum_{i=1}^{n} X_i^p}\right] \sum_{i=1}^{n} X_i^a$$

Throughout this paper it has been maintained that the separation of variances should be limited to variables and relationships considered in the planning process (and then only when comparable actual outcomes are available). Interpreting the results achieved by the mix/quantity separation illustrated in Table 3 requires an assumption not evident in the planning process. This assumption is that the mix which emerges from the combination of the separate estimates for each product constitutes a planned mix. Except in special circumstances (discussed below) it is nonsense to claim that a sales mix is explicitly planned. Recall that, so far, consideration in this paper is restricted to analysing revenue variances where there is no identified relationship between the sales volume of individual products. This implies that management does not consider a change in volume for one product is likely to be associated in any way with a change in volume of other products. Certainly by virtue of the planning process (estimating separately for each product, physical quantities to be sold and an average price) a planned mix emerges. Generally, it is untrue that the planned mix is ascertained by estimating a total 'all product' quantity[5] and then apportioning it over individual products. This is, however, the implicit procedure built into the determination of a traditional mix and quantity variance as illustrated by the calculation of the $[X_i^{q'}]$ variable in Table 3.

Providing management with mix and quantity variances is likely, therefore, to be misleading as they imply that a possible 'cause' of the revenue variance is a change in mix. The only possible 'causes' that require investigation are simply deviations from planned price or planned volume (that is, only the variables explicitly considered in the planning process). These deviations are identified in the procedures summarised in Table 1. The procedures illustrated in Table 3 provide no useful additional information.

It may well be this type of application in an analytical model that prompted Dyckman to comment that 'models . . . should not be applied merely because they meet the . . . requirements of the "game" if the "game" does not capture the problem' (Dyckman, 1988, p. 117). In most cases, determination of mix and quantity variances are applications of a model which capture a non-existent problem.

Determination of relational variances

Despite the foregoing misgivings concerning their usefulness, there are situations in which determination of variances similar in nature to mix variances may be appropriate. These situations exist *only* where there is an identified relationship expected between the volumes of each product sold. Examples of such a relationship might be: the sale, by the firm, of a number of similar products (differentiated by single characteristics such as size) where sales of individual products are *expected* to vary proportionally with total sales; the sale of complementary products (where increased sales of one product are *expected* to result in increased sales in another); the sale of product substitutes (where increased sales of one product are *expected* to result in decreased sales of another); and the sale of heterogeneous products, the quantities of which are limited by factors of production (for example, where sale of products with lower contribution margins per limiting resource factor are made only if products with higher contribution margins cannot be sold).[6]

The difference between these situations and the situations inherent in the traditional approach to mix variance determination is quite clear. Determination of a mix (or perhaps, more appropriately, relational) variance is advocated only where relationships are *expected* between product volumes and these relationships are incorporated in the planning model. Then and only then is determination of a relational variance appropriate. The separation of the volume variance into a relational and quantity variance is dependent upon that planned relationship.

In instances where the total sales of individual products are *expected* to occur in a constant relationship or mix, it is reasonable to expect that management will be interested in how the volume variance is affected by deviations from that planned relationship. An appropriate method for introducing expectations of this nature into an analytical planning model is initially to specify the total planned physical sales volume (denoted as $\hat{x}^p$) and then apportion the total sales over individual products. The basis of that apportionment (α_i for the *i*th product) reflects the expected proportion of the total physical volume that is associated with each product. It is necessary for expectations expressed in this manner that:

$$\sum_{i=1}^{n} \alpha_i^p = \alpha_1^p + \cdots + \alpha_n^p = 1 \qquad (2)$$

The expected physical sales volume for each product is then $X_i^p = \alpha_i^r \hat{X}^p$.

---

[5] A telling condemnation of the traditional mix variance computation is its necessary reliance on an arbitrarily defined unit of product. The numerical expression of the total quantity of products is dependent on the unit of measure chosen (what is the total of a kilogram of grapes and a hand of bananas?). Application of traditional procedures will result in different apportionment to quantity and mix variances when different units of measure are used. The consequence of this problem is discussed more fully by Peles (1986).

[6] Further useful separations of variances in situations similar to this latter case are discussed by Demski (1967).

Table 4
Recommended Further Separation of Volume Variances

Product	*Relational Variance*	+	*Quantity Variance*	=	*Volume Variance*
1	$P_1^p(X_1^a - \alpha_1^p \hat{X}^a)$	+	$P_1^p(\alpha_1^p \hat{X}^a - \alpha_1^p \hat{X}^p)$	=	$X_1^a P_1^p - \alpha_1^p \hat{X}^p P_1^p$
	+		+		+
.	.	+	.	=	.
.	.	−	.	=	.
.	.	+	.	=	.
	+		+		+
n	$P_n^p(X_n^a - \alpha_n^p \hat{X}^a)$	+	$P_n^p(\alpha_n^p \hat{X}^a - \alpha_n^p \hat{X}^p)$	=	$X_n^a P_n^p - \alpha_n^p \hat{X}^p P_n^p$
	=		=		=
	$\sum_{i=1}^{n} P_i^p(X_i^a - \alpha_i^p \hat{X}^a)$	+	$\sum_{i=1}^{n} p_i^p(\alpha_i^p \hat{X}^a - \alpha_i^p \hat{X}^p)$	=	$\sum_{i=1}^{n} (X_i^a P_i^p - \alpha_i^p \hat{X}^p P_i^p)$

The revenue variance for an individual product $[X_i^a P_i^p - \alpha_i^p \hat{X}^p P_i^p]$ may be separated into a price and volume variance by interposing a flexible budget (actual quantity at planned price). Because there is a planned relationship between products, it is appropriate to interpose a further relational flexible budget (planned proportion of total actual quantity at planned price). The volume variance $[X_i^a P_i^p - \alpha_i^p \hat{X}^p P_i^p]$ can then be separated into a relational variance and a quantity variance. Table 4 summarises this further separation of the volume variance.

As was the case for the general revenue variance model developed earlier, the emphasis in this extension of the model is on the determination of variances associated with each product. Total relational and quantity variances are determined merely by aggregating the individual variances. It is important to note that the procedure summarised in Table 4 follows the rationale used throughout this paper of only introducing further separation of variances when such separation is based on elements of the planning process. The criticism of combining physical units with dissimilar properties is overcome by virtue of the expressed condition that the procedure only be followed where the relationship is planned (implying an ability, at least in the minds of management, to combine the physical quantities).

A slight alteration is required for other situations in which a relationship between products may be planned. There may be instances where sales of products in a group are expected to vary in proportion to sales of a 'critical' product, X_1 (for example, where other products are complementary to or substitutes for the 'critical' product). The planned relationship in terms of physical volume may then be expressed as:

$$X_i^p = \alpha_i^p X_1^p \qquad (3)$$

The term α_i^p is an expression of the planned relationship of product X_i sales volume to the sales volume of X_1. It follows that $\alpha_1^p = 1$. Planned prices can then be combined with the volume estimates to determine total planned revenue. The individual product volume variance is then separated into a relational variance and a quantity variance. As $\alpha_1^p = 1$, $X_1^a - \alpha_1^p X_1^a = 0$ and there will, therefore, be a zero relational variance for the critical product, X_1. With this one exception, determination of a relational variance and quantity variance for each product could proceed in the manner summarised in Table 4 by replacing $\hat{X}$ with X_1.

Conclusion

The revenue variance model is an analytical tool designed to enable the separation of the difference between actual and planned total revenue into meaningful categories to facilitate further analysis. Meaningful categories are (or should be) dictated by management and are best indicated by recourse to the planning process. For normal revenue variances the only meaningful categories dictated by the planning process are a price and a volume variance isolated by product.

However, when measures with mathematical properties exist in a model there is a temptation to use all available analytical techniques. With respect to comparable data there can be no objection to this procedure. Where the numbers are contrived, the analysis (and the usefulness of its results) must be limited. In the case of the revenue variance model it is a nonsense to impute outcomes on the basis of unplanned events. Unless management expects, and builds into its planning model, a relationship between sales of various products, there can be no basis for determining mix variances. Separation of volume variances into relational and quantity components is appropriate only in situations where the planning model explicitly integrates expected relationships between products. Such a separation should rely on the planned relationships and not on artificially contrived weights applied to actual outcomes.

References

Bastable, C. W. and Bao, B. H. (1988), 'The Fiction of Sales-Mix and Sales-Quantity Variances', *Accounting Horizons*, June.

Demski, J. S. (1967), 'An Accounting System Structured on a Linear Programming Model', *Accounting Review*, October.

Dyckman, T. R. (1988), 'The King's New Clothes?', *Accounting Horizons*, June.

Hirsch, M. L. (1988), *Advanced Management Accounting*, PWS-Kent, Boston.

Kaplan, R. S. and Atkinson, A. A. (1989), *Advanced Management Accounting*, Second Edition, Prentice-Hall, Englewood Cliffs.

Peles, M. C. (1986), 'A Note on Yield Variance and Mix Variance', *Accounting Review*, April.

Rickets, D. and Gray, J. (1988), *Managerial Accounting*, Houghton Mifflin Company, Boston.

Wilson, R. M. S. and Chua, W. F. (1988), *Managerial Accounting: Method and Meaning*, VNR International.

Accounting and Business Research, Vol. 21, No. 18, pp. 41–40, 1990

Intangible Marketing Assets: A Managerial Accounting Perspective

C. Guilding and R. Pike*

Abstract—Intangible marketing assets, such as brand strength, product image and reputation, appear to be of growing significance to companies. This paper seeks to offer a management accounting perspective on intangible marketing assets. A typology is developed that categorises related constructs, hitherto referred to, somewhat broadly, as marketing assets. The typology (1) redefines intangible marketing assets from an accounting perspective, and (2) identifies the inputs and outputs of the intangible marketing asset management process. The traditional accounting methods afforded to intangible marketing assets are noted, together with their adverse implications for asset development. It is suggested that management accounting should develop a method of accounting for such assets that is more consistent with supporting longer-term corporate objectives.

Introduction

The accounting treatment of goodwill, as an aggregate intangible asset, has been discussed in the literature over many years (e.g. Dicksee, 1897; Leake, 1914; Canning, 1929; Gynther, 1969; and Miller, 1973). While this paper may be regarded as a continuation of this debate, by focusing on the problems of management accounting and the segregation of intangible marketing assets, it also offers an alternative perspective on goodwill. This departure from the issues traditionally addressed in the goodwill debate provides a perspective that has hitherto received scant academic consideration.

The development of intangible marketing assets such as product image, reputation and brand strength can be seen to be closely associated with marketing activities. A fuller definition of intangible marketing assets is provided in the next section. As a result of the critical role that such assets play in securing long-term commercial success, they can assume considerable economic value.[1] The fact that such intangible marketing assets are generally afforded no explicit accounting recognition calls into question the adequacy of the way in which they are financially monitored and, by implication, operationally managed.

This paper seeks to offer a management accounting perspective on intangible marketing assets. It explores the authors' contention that despite the many difficulties associated with accounting for intangible marketing assets, regular measurement and monitoring is a necessary element of the accounting control process if management control is to be consistent with longer-term interests.

Initially, the paper examines intangible marketing asset accounting in its organisational context and also considers the reasons for the growing importance of such assets. Short-termism and other dysfunctional implications associated with management accounting adopting a 'financial accounting' approach to this group of assets are noted. A typology is then developed, categorising constructs hitherto referred to, somewhat broadly, as marketing assets. The typology highlights the segregation problems encountered when accounting for intangible assets and identifies the inputs and outputs associated with intangible marketing asset management. A distinction is drawn between two ways of ameliorating the dysfunctionalism referred to above: intangible marketing asset valuation and cost capitalisation. Finally, brand valuation and advertising capitalisation are elaborated upon to illustrate the typical merits and problems associated with these alternative approaches to accounting for intangible marketing assets.

Organisational perspective

To understand better the nature of the problem that intangible marketing assets pose to management accounting, it is necessary to place the issue in its organisational context. It has been suggested

---

*The authors are, respectively, Teaching Fellow and Provident Group Professor of Finance and Accounting at the University of Bradford. They acknowledge the helpful comments of two anonymous referees and Reva Brown of the University of Bradford.

[1] This is supported by the valuation of intangible assets included in Rank Hovis McDougall's 1988 and 1989 published statements. In 1988 brands were valued at £678 million (i.e. 55% of the company's £1,244 million reported net assets) and in 1989 they were valued at £740 million (i.e. 51% of the £1,438 million reported net assets).

that the marketing/accounting interface suffers from the small extent to which management accounting has evolved from its production roots towards assuming any facets of a marketing orientation (Rayburn, 1981; Wilson and Bancroft, 1983). More recently, Ratnatunga *et al.* (1989) found that, although the marketing/accounting interface has developed beyond that which had been observed in earlier studies, there is still general dissatisfaction with the quality of accounting systems in providing information for marketing decision making.

Kaplan (1984) believes that a substantial proportion of management accounting's development as a distinct body of accounting knowledge can be traced to the period prior to 1925. The predominant corporate ethos at that time has been characterised as being of a production orientation (Keith, 1960). Several commentators have suggested that the production function has thus exerted a critical influence on management accounting and that its inception was attributable to financial accounting's need for product cost when preparing annual accounts (see, for example, Johnson, 1986).

The continuation of this anachronistic orientation is bound to call management accounting's continued relevance into question. Harrison (1978), in his consideration of the evolution of accounting involvement in the marketing function, argues that, while the production era has been described as giving way to first a sales era and now a marketing era, management accounting has not adapted in a manner consistent with the evolving organisational needs brought about by such environmental developments.

The organisational demands placed on the management accountant in the marketing era should not be underestimated. Production can be seen to reside at the input (cost) side of the business while marketing operates in the more open-ended, output (revenue) side of the business. This distinction means that, while production effectiveness may be monitored in terms of cost minimisation, marketing performance, with its emphasis on the development of a strong market position, does not lend itself so readily to traditional accounting-based controls. Marketing, with its outward-looking, growth-seeking, opportunistic stance can thus be seen to lie in cultural conflict with the management accounting, inward-looking, cost-minimisation orientation (Wilson, 1988).

The view that the marketing/accounting interface in fact represents more of a fracture than common ground is a widely documented observation (Wilson, 1970; Berry, 1977; Wilson and Bancroft, 1983; Moss, 1986; Simmonds, 1986; Srikanthan *et al.*, 1989). Berry comments: 'Given: one marketing manager and one accounting manager. Finding: poor communication on financial criteria and goals'.

Origins of 'marketing assets'

The term 'marketing asset' has been increasingly used in the marketing literature in recent years.[2] There has, however, been very limited interest shown in the accounting literature on the problems encountered when attempting to report intangible marketing assets, or the implications that arise from failing to do so.

Take-over activity has heightened the awareness of non-accountants that the balance sheet is not a market valuation instrument and that, under the historical cost convention, it excludes assets where cost is not easily verifiable. Such assets can frequently be attributed to activities of the marketing function and, as will be inferred in the typology developed below, these assets represent important corporate attributes, instrumental in the development of competitive advantage.

The relative economic importance of such assets is, in fact, supported by the size of the take-over bids, and it is only when such a bid is successful that the value of intangible marketing assets is afforded any, albeit vague, recognition, through the creation of the goodwill account (i.e. the amount paid in a take-over that is in excess of the fair value of the acquired company's separable net assets). The decade leading up to the 1987 stock market crash saw a growth in the average size as well as the number of take-overs. This period also witnessed a steady rise in stock market prices which has contributed to the considerable increases in the recorded value of goodwill following take-overs (Barwise *et al.*, 1989).

A second factor that may be considered contributory to the attention currently commanded by all marketing assets, is a shift in corporate strategy in recent years. Ohmae (1983), referring to the General Electric/Shell Directional Policy Mix, sees a shift away from corporate attempts to diversify into whatever areas represent opportunities for growth, towards growth that ensues from a complete examination of corporate strengths and weaknesses. Such an examination has perhaps led to an increased appreciation of off-balance sheet, intangible marketing assets. Davidson (1987) describes this shift in emphasis as a move from 'market-based marketing' towards 'asset-based marketing'. Market-based marketing focuses on the company's ability to react profitably to customer wants, while asset-based marketing relates to how effectively the company can use its assets to satisfy wants in the market. This distinction is important because it moves from a shorter-term reactive approach to a longer-term proactive strategy. This development raises the strategic significance of marketing assets and the corporation's need to develop an accounting system that adequately accommodates them.

---

[2] For example, the *European Journal of Marketing* devoted an entire issue (Vol. 20, No. 1, 1986) to this topic.

Description of marketing assets

'Marketing assets', a term that subsumes intangible marketing assets, is used in such a broad manner that it is impossible to find a widely accepted, precise definition in the literature. This problem of definition stems from the fact that marketing assets support the notion of competitive advantage, a construct that is itself open to varying interpretations depending on the observer's orientation and the strategy of the company under consideration. Further problems encountered when considering competitive advantage reflect its state of constant change as it is continuously affected by evolving environmental factors.

Attempts designed to appraise competitive advantage systematically (e.g. Simmonds, 1986) leave one with the conclusion that there is likely to be a high degree of subjectivity involved. The inextricable linkage between marketing assets and competitive advantage can be seen to lie at the root of the problem of accounting recognition of intangible marketing assets. Tangible marketing assets circumvent this problem by amortising the historical cost incurred upon acquisition. With respect to intangible marketing assets, however, one is left to grapple with the same problems of subjectivity that are inherent in an assessment of competitive advantage. While one may expect that the critically distinct internal orientation of management accounting would provide adequate insulation from the rigour of objective verification imposed by the external orientation of financial accounting, empirical studies (American Accounting Association, 1972; Rayburn, 1981; Wilson and Bancroft, 1983; Ratnatunga, 1987), suggest a dearth in the development of internal accounting systems that operationalise the subjectivity implicit in competitive advantage appraisal. It can be surmised that subjectivity continues to represent a profound obstacle to internal accounting recognition of competitive advantage.

Attempts to identify marketing assets have not resulted in the type of widely accepted and comprehensive list of assets with which accountants are familiar (e.g. see Piercy, 1986). As can be expected when dealing with a class of assets that encompasses both tangible and intangible categories, authors use various classifications. King (1973), without explicitly using the term 'marketing asset', refers to various assets and strengths of the company under the two headings: marketing expertise and relations with consumers.

To King's two categories, Piercy (1986) adds market share, brand loyalty, logistical expertise and marketing organisation. An alternative nomenclature is adopted by Davidson (1983), who lists 43 marketing assets under the headings of people, working capital, capital equipment, customer franchises, sales/distribution/service network and scale advantages. An itemisation of marketing assets can be as lengthy as any list of traditional ledger accounts and broad enough to cover a spectrum that ranges from the physical assets supporting the marketing effort to human resource accounting applied to the marketing staff.

The list below (based on Wilson's 1986 marketing asset identification) includes the major marketing assets that some claim are subject to inappropriate accounting treatment: advertising, entry barriers, brands, trademarks, information systems, product line, new product development, customer service, customer protection, reputation, image, sales territory, markets, market share, geographic area, loyal dealer organisation, and channel control.

A problem encountered when itemising marketing assets is the degree of overlap in the constructs considered. While the need for demarcation may not be relevant to marketing management, it is of major concern to both management and financial accounting due to the aggregation procedures used, a process that involves identification and measurement of assets. The arbitrariness that appears to be unavoidable when attempting to distinguish between intangible assets has been discussed by Miller (1973) in his contribution to the goodwill debate. This arbitrariness assumes the guise of impossibility when attempting to segregate some of the assets identified above, e.g. brands, image and reputation. It would thus appear that a redefinition of intangible marketing assets, made from a management accounting perspective, is a prerequisite for inclusion in the internal accounting system. The typology developed later can be viewed as a first step in the direction of securing this prerequisite.

Management accounting for intangible marketing assets

Much of the above discussion has been conducted from a general accounting, as opposed to a specific management accounting, perspective. Such discussion is pertinent, as the empirical studies cited above indicate that, consistent with external reporting practices, there is minimal deployment of internal accounting techniques that recognise such assets.

The apparent tendency of management accounting to adopt rather than adapt financial accounting practices has given cause for concern (see e.g. Rappaport, 1978; Kaplan, 1983; Allen, 1988; Hiromoto, 1988). The different orientations of management and financial accounting are evident when one recognises that financial accounting has developed in a manner consistent with the needs of stewardship reporting while management accounting is more concerned with internal decision making and control. Allen (1988) sees decision making as an activity that is forward looking, calling for unavoidably subjective valuations to be placed on expected outcomes. The relevance of this observation to calls for intangible marketing asset valuation is immediately apparent. Despite the theoretically distinct nature of these two accounting orientations, Kaplan (1983) notes that they have not been translated into distinct reporting practices. He comments:

> We need to examine why firms have tended to use for internal planning and control, the same accounting procedures used for external reporting purposes. Depreciation and asset valuation methods, inventory valuation rules, and procedures for *capitalizing or expensing investments in intangible assets* can be made to differ between internal and external reporting. The firm should select for internal reporting those practices that best promote incentives for achieving its strategy and objectives. (p. 702; emphasis added)

As management and financial accounting are adopting the same practice with respect to intangibles, one needs to analyse further the rationale of goodwill accounting. In financial accounting, separability is the criterion employed to distinguish goodwill from other assets (Accounting Standards Committee, 1989). The difference between the market value of the business and the fair value of its separable assets is referred to as goodwill. A separable asset is one that can be identified and sold separately without disposing of the business as a whole. In Britain the preferred financial accounting treatment of goodwill has been for it to be immediately written off against reserves; however the ASC proposed in 1990 to bring Britain into line with the US practice of writing goodwill off against profits over a fixed period. The separability criterion can be defended in a financial accounting context as it is consistent with the principle of objective verification.

Adoption of the separability criterion appears, however, to be inappropriate for that branch of accounting concerned with the provision of information for decision-making and control. This is because it results in a loss of accountability with respect to those functions managing non-separable assets. In effect the internal monitoring of corporate assets that can represent more than 50% of net assets[3] is precluded by the practice of only maintaining accounts for separable assets.

Accounting control is sought in organisations through the practice of identifying responsibility centres and monitoring their performance. As profitability is the widely accepted critical dimension of accounting performance in commercial organisations, the adoption of an accounting system that fails to monitor profitability associated with investment in intangible marketing assets can be seen to undermine the efficacy of management accounting control of the marketing function. In effect, one is left to reconcile the problem of intangible asset segregation with Field and Gabhart's (1971) contention that the identification and valuation of such intangibles is intrinsic to the determination of the profitability of marketing expenditure.

Allen (1990) advocates that control systems should be designed to monitor performance in a manner more consistent with longer-term strategic goals rather than short-term operational goals, denominated in traditional financial accounting terms. The need for long-term performance measurement is particularly apparent with respect to the marketing function where activities such as the building of image, reputation and market share are of a long-term, strategic nature.

Kaplan (1984) explicitly recognises the problem of short-termist accounting controls and their impact on intangible asset development:

> Perhaps the most damaging dysfunctional behavior induced by a preoccupation with short-term profit center performance is the incentive created for division managers to reduce expenditures on discretionary and intangible investments.

A typology of intangible marketing assets

Despite the problems associated with attempts to segregate intangible assets, such analysis is deemed pertinent in order to facilitate a better understanding and to provide a framework within which to view intangible marketing asset value. If a method of intangible marketing asset recognition could be developed, then subsequent asset monitoring may shift the emphasis of control away from discretionary expenditure towards intangible asset creation, thereby ameliorating the dysfunctionalism referred to by Kaplan.

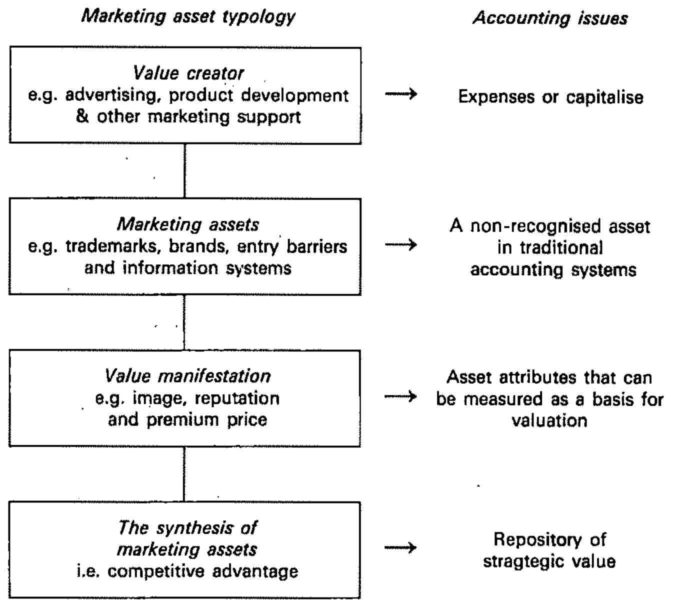
Figure 1, below, represents a first step towards the provision of a management accounting oriented definition of intangible marketing assets. This step is achieved through a reclassification of marketing related constructs that hitherto have been referred to as marketing assets. The constructs have been categorised using the four headings: value creator, marketing asset, value manifestation and the synthesis of marketing assets. The order in which the four categories have been presented can be viewed as a conceptual representation of the course of events that culminate in the creation of competitive advantage.

Consistent with many business activities, marketing activity involves investment, i.e. expenditure on components of the marketing budget, such as advertising and product development, that carry pay-offs beyond the accounting period in which

---

[3] See footnote 1.

Figure 1
A marketing asset typology viewed from a theoretical accounting perspective


Marketing asset typology
Accounting issues
Value creator
e.g. advertising, product development & other marketing support
Expenses or capitalise
Marketing assets
e.g. trademarks, brands, entry barriers and information systems
A non-recognised asset in traditional accounting systems
Value manifestation
e.g. image, reputation and premium price
Asset attributes that can be measured as a basis for valuation
The synthesis of marketing assets
i.e. competitive advantage
Repository of stragtegic value

they are incurred. These investments have been labelled value creators as they can be seen to be instrumental in the creation of marketing assets such as brands and entry barriers. Clearly, such intangible assets do not lend themselves to traditional accounting approaches of asset verification. The problematical issue of intangible asset measurement is addressed in the third category, value manifestation. Attempts to account for marketing assets are concerned with the translation of such examples of value manifestation as image, reputation and premium price into a marketing asset value. The final category, referred to as the synthesis of marketing assets, suggests that the inclusion of competitive advantage in previous lists of marketing assets appears to be inappropriate. This inappropriateness is highlighted by the segregation of marketing assets achieved by the typology. Competitive advantage appears to embrace all corporate assets and its inclusion in a list of marketing assets would thus represent double counting.

The limitations of this typology are evident when one considers whether a loyal dealer organisation should be regarded as a separate marketing asset or a manifestation of value. Similarly, advertising can be variously categorised. It can be viewed as a creator of short and long-term demand through informative and persuasive means. While the portion of advertising related to short-term demand creation may be expensed, the portion concerned with long-term demand creation can be viewed as the creator of a marketing asset such as brand loyalty, as manifested via a favourable brand image and reputation. This simplified example would suggest that long-term oriented advertising should be debited to a brand loyalty account which, in a similar fashion to other fixed asset accounts, may be subjected to revaluation. Alternatively, the discovery of a successful promotion slogan in an advertising campaign can be viewed as an asset in itself, as it can be advantageously deployed in the future.

While the typology does represent an original perspective of the segregation problem, it is only a first step, as segregation problems are still apparent with respect to those assets identified as marketing assets in the figure. In the example above, advertising designed to create brand loyalty has, by implication, created an entry barrier. If the essence of the entry barrier is the brand loyalty, it would clearly be inappropriate to account for both, as one would again be double counting. Despite its limited robustness, the classification does carry several meritorious aspects:

(1) It is an exercise that is fundamental to any attempt to account for intangible marketing assets. Such a redefinition of intangible marketing assets highlights the itemisation problems created by accounting's need to segregate and aggregate assets. In effect, the typology may stimulate debate on the most appropriate way of segregating intangible marketing assets for the purposes of accounting.

(2) It enhances our understanding of some of the theoretical issues surrounding intangible marketing asset accounting. For this reason it will act as a point of reference in the subsequent discussion.

From a more specific, management accounting, perspective the typology also carries the following implications:

(1) It demonstrates the rationale for marketing investment in the creation of intangible marketing assets which, in turn, converge to create competitive advantage. The delineation of this rationale may cultivate an enhanced marketing/accounting interface, by increasing accounting's appreciation of the nature of marketing investment in competitive advantage.

(2) It affords a greater degree of clarity to the intangible marketing asset. The extent of this clarity may not be sufficient for the asset to satisfy the strongly held financial accounting traditions of objective identification and verification with reasonable certainty (Solomons, 1989). It has already been noted, however, that management accounting's distinct orientation justifies the use of alternative criteria for asset recognition. In its role as the branch of accounting concerned with the provision of information for internal decision making and control, management accounting appears to be better disposed to account for intangibles. It is in this light that Allen (1986) sees management accounting's dismal record in applying values to assets as leaving it open to criticism.

(3) The way in which traditional management accounting practices fail to account for marketing assets in a realistic manner is evident when one considers this classification in the context of generally accepted accounting approaches. Expenditure of a 'value creator' nature is not recognised as an investment but expensed to the profit and loss account. This results in no value being afforded either to the resulting marketing asset, or to the company's enhanced competitive advantage. One adverse implication of this accounting treatment has been referred to in connection with internal accounting practices and short-termism.

(4) Management accounting, with its objective of contributing to organisational control, is concerned with the inputs and outputs associated with the organisation's various management processes (Otley and Berry, 1980). In its attempt to segregate intangible marketing assets from related concepts, the typology also aids in the clarification of the inputs and outputs associated with intangible marketing asset management (e.g. brand management). The inputs correspond to value creators while the value manifestation referred to in the typology can be seen to represent the output of the marketing asset management process. These relationships are captured in Figure 2. A prerequisite for control is that outputs are monitored and appropriate action taken via the feedback loop. Figure 2 can be seen to vindicate the claim that the absence of accountability over intangible marketing asset value undermines accounting control of the process of intangible marketing asset management.

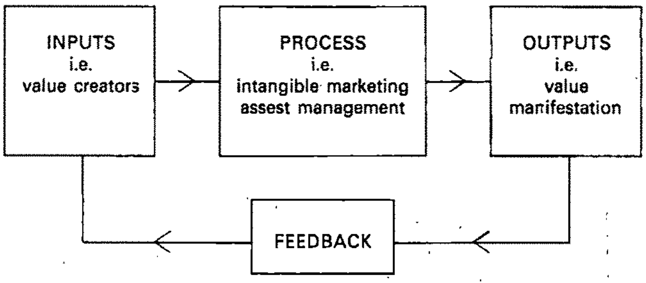
The typology's analysis of terms provides a framework for the remainder of the discussion in this paper. Issues surrounding the measurement of value manifestation will be addressed first. This is followed by a consideration of capitalising value creators, i.e. inputs to the marketing asset management process.

Brand valuation—an example of intangible marketing asset valuation

The valuation of company brands will be used as a practical example of the valuation of a marketing asset and its managerial accounting implications. Brands represent a particularly appropriate marketing asset for detailed consideration, as brand valuation has been the subject of considerable recent accounting debate. This debate centres on the contention of many accountants and marketing managers that a brand represents an asset defined with sufficient clarity to warrant separate recognition on the balance sheet.

An emphatic example of the importance of brands is provided by the Managing Director of United Biscuits Ltd. (Smiddy, 1983): 'We believe that the most important assets of United Biscuits are its brands. Buildings age and become dilapidated. Machines wear out. Cars rust. People die. But what lives on are brands'.

Figure 2
The process of intangible marketing asset management



While a more extensive examination of the merits of the various brand valuation techniques is available elsewhere (e.g. Penrose and Moorhouse, 1989; Barwise *et al.*, 1989), identified below are the major methods upon which such a valuation can be based:

—cost (valuation based on the input costs incurred in the development of the brand).

—market (valuation based on the amount at which a brand can be sold).

—premium price (valuation based on an estimate of the present value of the future 'premium price revenues of the brand'). This method is supported by Mullen and Mainz (1989), and represents a valuation based on one of the examples of value manifestation identified in the typology.

—net present value (valuation based on discounting expected brand-related cash flows to present values).

—brand strength valuation (based on an estimate of brand strength and profitability). This form of calculation was employed in the recent, much publicised valuation of Rank Hovis McDougall's brands (Penrose and Moorhouse, 1989). The method involved an estimate of seven brand-related factors (leadership, stability, market, internationality, trend, support, and protection). In terms of the typology, each of these factors represents a manifestation of brand value.

Internal monitoring of brand value provides an alternative performance measure. French *et al.* (1965) found that the setting of quantifiable targets resulted in superior performance. In the light of this finding, research is called for to assess whether incorporation of brand value in the budget would help to clarify the objective of the brand function and act as a positive motivational force for brand managers.

A further implication of internal accounting recognition of brand value is that it may affect the perceptions of organisational members with respect to the importance of brands and brand value development. The following comment on the influential role of accounting can be regarded as characteristic of the views of several other commentators (e.g. Cooper *et al.*, 1981; Bruns and Kaplan, 1987):

> What is accounted for can shape organizational participants' views of what is important, with the categories of dominant economic discourse and organizational functioning that are implicit within the accounting framework helping to create a particular conception of organizational reality. (Burchell *et al.*, 1980, p. 5).

Advertising—an example of a value creator

One can draw a comparison between the accounting treatment afforded to the value-creating expenditure associated with marketing assets (the majority of which are intangible) and that applied to investment in production assets (the majority of which are tangible). Production assets, whether 'home grown' (constructed by company employees) or externally purchased, are capitalised and depreciated over their estimated useful life. The efficient use of such assets may be monitored through the application of such indicators of financial performance as return on investment. With respect to intangible marketing assets, due to the practice of expensing the value creator expenditure, no financial record of these assets is maintained, thereby precluding the use of accounting-based performance measures.

The management and financial accounting practice of expensing all intangible marketing asset expenditure and the dysfunctional short-termist implications it carries, have been noted above. In his examination of 'cost and profit myopia in marketing', Piercy (1982) claims that short-termism will result in risk averse marketing bureaucrats and a loss of entrepreneurial vigour and dynamism. At the root of the problem described by Piercy is the view that the practice of expensing marketing expenditure causes it to be regarded as a 'cost' rather than an 'investment'. Piercy's claim is given credence in the light of Merchant's (1985) finding in the United States that accounting-based controls are perceived to be the most important organisational controls over discretionary expenditure.

A second finding in Merchant's (1985) study was that expensed outlays are subject to tighter controls than those controls that are exerted over capitalised outlays. One is left with the conclusion that the accounting treatment used with respect to marketing expenditure is biased against investment to support competitive advantage. Such a situation can only hinder the development of a basis for successful marketing/accounting interaction. It would appear that this indictment, together with the suboptimal allocation of resources implied above, are two matters that could be rectified through the adoption of an alternative accounting treatment with respect to intangible marketing asset input costs.

The empirical literature sheds little light on the question of whether expensing results in reduced expenditure. Horwitz and Kolodny (1980) found that expensing did result in a reduced amount of privately funded R&D expenditure. This finding was not supported by Dukes, Dyckman and Elliott (1980), however, who found that the changed accounting requirement had no discernible effect on the level of R&D expenditure. Elliott *et al.* (1984) attempted to reconcile the two studies by hypothesising that the effect may be more apparent in smaller companies (which were studied by Horwitz and Kolodny) than in large companies (which were studied by Dukes *et al.*). This hypothesis received partial support from their research. However, the question of whether expensing R&D results in reduced expenditure has not been satisfactorily answered.

The marketing asset input cost that probably best lends itself to a consideration of a form of deferred costing or amortisation treatment is advertising. Concern that amortisation of advertising costs is an arbitrary exercise can be countered by noting the degree of subjectivity involved in depreciation, which, despite this subjectivity, is the generally accepted, rational mode of accounting for fixed assets. There is, as Thomas (1969) argues, a degree of subjectivity involved in allocating most costs; but Rayburn (1986) takes an alternative view of the problem by raising the rhetorical question '. . .can it not also be said that the procedure of expensing all advertising outlays is also arbitrary?'.

The practice of capitalising an element of marketing expenditure (e.g. advertising) adopted by some US companies when producing interim statements, strengthens the arguments of the proponents of capitalisation of marketing asset inputs (Rayburn, 1986). If it is legitimate to recognise the carry-over of an asset at the interim stage, why not adopt such a practice in the internal accounts at the year end? Capitalising advertising at the interim stage is presently justified by accountants on the grounds that it provides a better basis for comparison of interim periods within one accounting year. It would appear that this practice is not pursued at the year end because it would be inconsistent with the policy adopted in the full year's published statements.

The implications of traditional accounting for brands and advertising have been elaborated upon, as examples of a marketing asset and marketing asset value creator, respectively. While different examples of these two classifications are evident in Figure 1, it is believed that these two serve well for explanatory purposes, the former because it has been the subject of considerable recent accounting debate and the latter because it is considered to exemplify best the typical qualities of a value creator.

Conclusion

This paper has sought to offer a management accounting perspective on intangible marketing assets. A typology was developed, based on a theoretical accounting perspective, categorising related constructs, hitherto referred to somewhat broadly, as marketing assets. The typology highlights: (1) the need to redefine marketing assets for accounting purposes, (2) the segregation problems associated with such assets, (3) the inputs and outputs associated with the intangible marketing asset management process.

Financial accounting principles are ill-suited to accommodate intangible assets. Empirical studies indicate that management accounting has not, as yet, developed an alternative accounting treatment designed to recognise such assets. Proponents of an alternative management accounting treatment with respect to marketing assets appear to have a strong cause. It is claimed that in the absence of both a valuation of the assets and capitalisation of value-creating expenditure, sub-optimal decision-making occurs and an opportunity to build and support marketing assets is lost. We suggest that accounting recognition of intangible marketing assets would cause them to be held in the esteem that they deserve. Currently, with regard to intangible marketing assets, the management accounting treatment appears to carry an undesirably powerful internal influence, conflicting with the important strategic notion of developing competitive advantage.

The fundamental conflict that exists between intangible asset recognition and objective measurement is less pronounced when viewed from a management accounting perspective. This is because the need for independent verification through the external audit is no longer an issue. Barwise *et al.* (1989), while criticising the use of brand valuation in published statements, note that it may represent a useful internal management exercise:

> It may aid internal disclosure and visibility, and it may help both brand managers and senior management to gain a much deeper understanding of their brands and take a long-term view of the development and exploitation of brand equity. (p. 76)

If we accept Kaplan's (1984) assertion that financial accounting is the driving force behind the development of management accounting policy, there would appear to be a strong case that, with respect to accounting for intangible marketing assets, management accounting should move out of the shadow of its financial counterpart.

To substantiate this claim, further research is called for to investigate the possible ways of providing alternative accounting treatments for intangible marketing assets. Justification of such treatments would require testing whether they resulted in a stronger organisational commitment to the development and maintenance of competitive advantage as well as an enhanced accounting/marketing interface. Such commitment would, for example, be evidenced by increased expenditure on those outlays categorised as marketing asset creators.

References

Accounting Standards Committee (1989), *Statement of Standard Accounting Practice 22, Accounting for Goodwill.*

Allen D. (1986), 'Strategic Financial Management', in Bromwich M. and A. Hopwood (eds), *Research and Current Issues in Management Accounting*, Pitman.

Allen D. (1988), 'The Hitch-Hiker's Guide to Strategic Financial Management', *Management Accounting*, Vol. 66, October, pp. 12–13.

Allen D. (1990), *Creating Value, The Financial Management of Brands*, The Chartered Institute of Management Accountants.

American Accounting Association Committee (1972), 'Report on the Committee on Cost and Profitability Analysis for Marketing', *Accounting Review*, Supplement to Vol. 47, pp. 575–615.

Barwise P., Higson C., Likierman A. and P. Marsh (1989), *Accounting for Brands*, The London Business School and the Institute of Chartered Accountants in England and Wales.

Berry D. (1977), 'Profit Contribution: Accounting and Marketing Interface', *Industrial Marketing Management*, Vol. 6, No. 2, pp. 125–128.

Bruns W. J. and Kaplan R. S. (eds.) (1987), *Accounting and Management; Field Studies Perspectives, Colloquium Papers*, Harvard Business School Press.

Burchell S., Clubb C., Hopwood A., Hughes J. and J. Naphiet (1980), 'The Roles of Accounting in Organizations and Society', *Accounting, Organizations and Society*, Vol. 5, pp. 5–27.

Canning J. B. (1929), *The Economics of Accountancy*, Ronald Press Company.

Cooper D., Hayes D. and F. Wolf (1981), 'Accounting in Organized Anarchies', *Accounting, Organizations and Society*, Vol. 6, pp. 175–191.

Davidson H. (1983), 'Putting Assets First', *Marketing*, 17 November, pp. 35–39.

Davidson H. (1989), *Offensive Marketing*, Penguin, 2nd ed.

Dicksee L. R. (1897), 'Goodwill and its treatment in accounts', *Accountant*, January 9, pp. 40–48.

Dukes R., Dyckman T. and J. Elliott (1980), 'Accounting for Research and Development Costs: The Impact on Research and Development Expenditures', *Journal of Accounting Research*, Supplement, Vol. 18, pp. 1–37.

Elliott J., Richardson G., Dyckman T. and Dukes R. (1984), 'The Impact of SFAS No. 2 on Firm Expenditures on Research and Development: Replications and Extensions', *Journal of Accounting Research*, Vol. 22, Spring, pp. 85–102.

Field G. and D. Gabhart (1981), 'Cultural Lag and Homeostasis in Accounting Theory and Practice', in Wilson (1981), pp. 81–90.

French J. R. P., Kay E. and Meyer H. (1965), 'Split Roles in Performance Appraisal', *Harvard Business Review*, Vol. 43, Jan–Feb, pp. 123–129.

Gynther R. (1969), 'Some Conceptualizing on Goodwill', *Accounting Review*, Vol. 44, pp. 247–255.

Harrison G. (1981), 'The Accountant's Role in Marketing: A Bibliographical Study and Analysis of its Origins and Development', in Wilson (1981), pp. 22–57.

Hiromoto T. (1988), 'Another Hidden Edge—Japanese Management Accounting', *Harvard Business Review*, Vol. 66, July–Aug, pp. 22–26.

Horwitz B. and R. Kolodny (1980), 'The Economic Effects of Involuntary Uniformity in the Financial Report of R&D Expenditures', *Journal of Accounting Research*, Supplement, Vol. 18, pp. 38–74.

Johnson H. (1986), 'The Organizational Awakening in Management Accounting History', in Bromwich M. and A. Hopwood (eds), *Research and Current Issues in Management Accounting*, Pitman.

Kaplan R. S. (1983), 'Measuring Manufacturing Performance: A New Challenge for Managerial Accounting Research', *Accounting Review*, Vol. 58, October, pp. 686–705.

Kaplan R. S. (1984), 'The Evolution of Management Accounting', *Accounting Review*, Vol. LIX, July, pp. 390–418.

Keith R. J. (1960), 'The Marketing Revolution', *Journal of Marketing*, Vol. 24, No. 1, January, pp. 35–38.

King S. (1973), *Developing New Brands*, London, Pitman.

Leake P. D. (1914), 'Goodwill: Its Nature and How to Value It', *Accountant*, January, pp. 81–90.

Merchant K. A. (1985), 'Organizational Controls and Discretionary Program Decision Making: A Field Study', *Accounting, Organizations and Society*, Vol. 10, No. 1, pp. 67–85.

Miller M. C. (1973), 'Goodwill—An Aggregation Issue', *Accounting Review*, Vol. 48, pp. 280–291.

Moss C. D. (1986), 'The Marketing Accountant in Industry', *European Journal of Marketing*, Vol. 20, No. 1, pp. 95–103.

Mullen M. and A. Mainz (1989), 'Brands, Bids and Balance Sheets: Putting a Price on Protected Products', *Acquisitions Monthly*, April, pp. 26–27.

Ohmae K. (1983), *The Mind of the Strategist: Business Planning for Competitive Advantage*, Penguin Books.

Otley D. T. and Berry A. J. (1980), 'Control, Organizations and Society', *Accounting, Organizations and Society*, Vol. 5, pp. 231–244.

Penrose N. and M. Moorhouse (1989), *The Valuation of Brands*, published by Interbrand Group plc and Rank Hovis McDougall.

Piercy N. (1982), 'Cost and Profit Myopia in Marketing', *Quarterly Review of Marketing*, Vol. 7, No. 4, Summer, pp. 1–12.

Piercy N. (1986), 'Marketing Asset Accounting: Scope and Rationale', *European Journal of Marketing*, Vol. 20, No. 1, pp. 5–15.

Rappaport A. (1978), 'Executive Incentive vs Corporate Growth', *Harvard Business Review*, Vol. 56, July/Aug, pp. 81–88.

Ratnatunga J. T. D. (1987), 'The Impact of Financial Controls in Marketing', unpublished PhD thesis, Bradford Management Centre.

Ratnatunga J., R. Pike and G. J. Hooley (1989), 'New Evidence on the Accounting-Marketing Interface', *British Accounting Review*, Vol. 21, No. 4, pp. 351–370.

Rayburn L. G. (1981), 'Marketing Costs—Accountants to the Rescue', *Management Accounting (USA)*, Vol. 62, No. 7, January, pp. 32–41.

Rayburn L. G. (1986), 'Accounting Principles and Marketing Models Related to Deferred Marketing Costs', *European Journal of Marketing*, Vol. 20, No. 1, pp. 75–82.

Simmonds K. (1986), 'The Accounting Assessment of Competitive Position', *European Journal of Marketing*, Vol. 20, No. 1, pp. 16–31.

Smiddy P. (1983), 'Brands—An Asset to be Ignored?', *Accountancy*, Vol. 94, No. 1079, July, pp. 95–96.

Solomons D. (1989), *Guidelines for Financial Reporting Standards*, The Institute of Chartered Accountants in England and Wales.

Srikanthan S., Ward K. and Neal R. (1989), 'Brand Accounting: Myth or Reality?', *Management Accounting*, Vol. 67, April, pp. 20–22.

Thomas A. (1969), *The Allocation Problem in Financial Accounting Theory*, American Accounting Association, Evanston, Illinois.

Wilson R. M. S. (1981), 'Accounting approaches to marketing control', 1970, in Wilson (1981).

Wilson R. M. S. (ed) (1981), *Financial Dimensions of Marketing*, Macmillan/ICMA.

Wilson R. M. S. (1986), 'Accounting for Marketing Assets', *European Journal of Marketing*, Vol. 20, No. 1, pp. 51–74.

Wilson R. M. S. (1988), 'Marketing and the Management Accountant', pp. 255–295 in R. Cowe (ed.), *Handbook of Management Accounting.*

Wilson R. M. S. and A. L. Bancroft (1983), *The Application of Management Accounting Techniques to the Planning and Control of Consumer Non-durables*, Occasional Paper Series, ICMA.

Financial Accountability & Management

Winter 1990 *Editor: John Perrin* *Vol. 6 No. 4*

Contents

Charging by British Government: Evidence from the Public Expenditure Survey
by DAVID HEALD

Capital Accounting and Charges in the National Health Service After 1991
by HOWARD MELLETT

Medical Audit and Resource Management: Lessons From Hip Fractures
by MARIAN CRAIG, CHARLES PRICE, ANN BACKHOUSE AND GWYN BEVAN

Charity Accounting—An Empirical Study of the Information Needs of Contributors to UK Fund Raising Charities
by NOEL HYNDMAN

Subscriptions

	1991 volume			
	UK only	Europe	Rest of the World	North America
Institutions, libraries and professional	£44.00	£49.50	£55.00	$100.50
Teachers or students	£19.00	£21.00	£23.50	$42.50

Journal of Business Finance & Accounting and *Financial Accountability & Management* (combined rate)

Institutions, libraries and professional	£104.00	£108.00	£120.00	$218.50
Teachers or students	£48.00	£50.00	£58.00	$105.00

Order from Journals Dept., Basil Blackwell Ltd., 108 Cowley Road, Oxford OX4 1JF, UK. Editorial communications to *Financial Accountability & Management*, Department of Economics, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK.

Accounting and Business Research, Vol. 21, No. 81, pp. 50–56, 1990

The Pricing of Initial Offerings of Privatised Companies on the London Stock Exchange

Kojo Menyah, Krishna N. Paudyal and Charles G. Inyangete*

Abstract—This paper investigates UK privatisation issues as initial public offerings (IPOs) of equities on the International Stock Exchange (London). Excess returns on such issues are compared with private sector initial public offerings. The results, which are unaffected by firm size and underwriting commission, indicate that, on an *ex post* basis, the issues provide excess returns above those of private sector firms on average by about 31% over a 32-week period. None of the existing theories of underpricing of IPOs is consistent with our results which imply wealth transfer to those who acquired the shares in privatised issues. After-market pricing was, however, found to be consistent with secondary market efficiency.

This paper investigates the pricing of initial public offerings (IPOs) of UK privatised companies and compares them with private sector new issues. Part of the cost of the privatisation programme induced by differences in market performance of private and public sector issues is identified and analysed in the context of the documented explanations and theories of IPO pricing.

Apart from the framework adopted, this study differs from earlier ones in which underpricing was measured either on the first day of trading (Veljanovski, 1987) or at the end of the first week (Buckland, 1987). We track after-market performance for up to 32 weeks after issue and investigate the efficiency of pricing when the issue commences trading.

Prior work on initial issues and the empirical proposition

The empirical literature on the pricing of IPO documents shows that, on average, they are underpriced. The size of the underpricing, however, varies with the stock market studied and factors which are assumed to relate to the issues.[1] The specific factors posited to account for underpricing include the age of the firm, asset size, size of the proceeds of issue and uses to which the proceeds will be applied (see, for example, Rock, 1986; Beatty and Ritter, 1986). These factors are, however, proxies for uncertainty associated with what the market valuation would be when trading commences. The primary causes of such uncertainty derive from the difficulties associated with the *ex ante* forecasting of the quality of management, earnings and growth options[2] implicit in the firm's assets in place. Such a difficulty arises largely from differential information available to market participants including the issuer and its advisers. Asymmetric information is therefore the major theoretical explanation for the phenomenon of underpricing IPOs. Tinic (1988) provides an alternative explanation based on the proposition that underpricing occurs to minimise the potential law-suits which may arise from poor after-market performance: the implicit insurance hypothesis. He argues that large initial returns have tended to reduce the probability of adverse judgements and damages since the 1933 US Securities Act introduced 'due diligence' requirements for issuers and their advisers. The paucity of civil cases in recent times on flotation prospectuses in the UK suggests

---

*The authors are, respectively, senior lecturer in accounting and finance at the City of London Polytechnic, and research associate and lecturer in accounting and finance at Strathclyde University. This paper has benefited from the comments of seminar participants at the University of Lethbridge, Canada. The authors are especially grateful for the comments of George Lermer. The comments of an anonymous referee are also acknowledged. Residual errors are ours.

[1] See Tinic (1988) and Finn and Higham (1988) for a summary of the size and range of underpricing in IPOs in various securities markets.

[2] The classic analysis of growth options implicit in a firm's investment decisions is by Myers (1977).

that it does not account for the observed underpricing.[3] We examine the information asymmetry hypotheses and assess their relevance for the UK privatisation issues.

Information asymmetry hypotheses

Baron (1982) argues that investment bankers have more information about investors' demand for securities than the issuing company. Issuing companies may therefore induce them to use their knowledge to minimise or eliminate underpricing by paying appropriate compensation. Muscarella and Vetsuypens' (1989) test of this hypothesis shows that even self-underwriting of investment banking firms going public produced underpricing comparable to that of similar-sized IPOs. Investment banker knowledge of the issuer and the market may therefore not eliminate underpricing.

Ritter (1985) and Rock (1986) argue that the uncertainty about the market valuation arises from information asymmetry between those who choose to invest in information (informed investors) and those who do not (uninformed investors). Informed investors submit bids mainly for underpriced issues; hence the losses on overpriced issues are mainly borne by the uninformed investors. Underpricing therefore occurs to ensure that uninformed investors are compensated for their losses on overpriced issues. This, on average, produces a risk-free rate of return to uninformed investors in IPOs. Koh and Walter (1989) provide evidence from Singapore to support this hypothesis. The relevant data is, however, not observable for all UK IPOs.[4]

The presence of differential information to investors in the UK privatisations is also doubtful because efforts were made to produce information about them to the public long before they were floated.[5] In view of the volume and wider availability of information on the privatisation issues, any information asymmetry between informed and uninformed investors should therefore be much smaller than in most IPOs. Since informed investors would in such a context also incur less cost in acquiring information,[6] underwriters should underprice less in such issues relative to those of the private sector.

We therefore conclude that both asymmetric information explanations of underpricing suggest that the privatisation issues should produce no more than the 'equilibrium' underpricing enforced in the new issues market. This is the major empirical proposition tested and reported below.

Empirical procedures

We measure market adjusted excess returns for each issue over the 32-week period as follows:[7]

$$MAR_t = [(TP_t - OP)/OP] - [(MI_t - MI_0)/MI_0] \quad (1)$$

where

MAR_t = market adjusted return at time t,
MI_0 = level of market index on the day the offer price was fixed,
MI_t = level of market index at time t,
TP_t = market price of the security at time t,
OP = offer price (amount paid) before the first day of trading.

The excess market adjusted returns are computed under a buy and hold strategy from the initial offer price up to 160 trading days after issue and averaged across the public and private sector issues respectively. Three different processes of empirical tests are used to determine whether the average return from one sector is dominated by another. Firstly, we applied a two-sample t-test (which does not require the equality of the sample variances) on the market adjusted excess returns available from these two portfolios. Secondly, we carried out a Mann–Whitney U-test of equality of median return available from the portfolios. Finally, to verify the reliability of the t-test, given the sample size, a boot-strapping procedure where the returns are resampled 32,000 times with replacement was used. In addition, to examine the efficiency of the market we analysed the after-market performance based on the strategy of buying on the first day of trading, and holding for up to 160 days.

Data

Our sample consisted of all 13 initial privatisation issues on the International Stock Exchange (London) from 1981 to 1987.[8] Data for private sector companies floated at about the same time as each privatisation issues were also collected. There were 148 private sector offer for sale issues during the period. Only those 21 which had relevant data for analysis were used. Data on offer prices, market prices, size of issues, commissions and type of issue were collected from the following sources: (a) Stock Exchange Fact Books and Supplements, (b) Datastream (an online financial database),[9] (c) Extel Book of Prospectuses and (d) the Financial Times. The price data, mainly from Datastream, were purged for Stock Exchange holidays. The Financial Times All Share Return Index which includes dividend payments was used to compute the market returns.

---

[3] The Financial Services Act 1986 nevertheless introduces statutory compensation for losses which may arise from false or misleading information in prospectuses.

[4] Some patchy evidence on allocations in IPOs is available for some corporations such as British Telecom.

[5] These include reorganisation, appointment of new senior management, loan write-offs for the heavily indebted (Curwen, 1986). The corporations were also aggressively marketed long before any formal announcements of their flotations were made. The real prospects of most companies should therefore have been revealed through such activities.

[6] This arises because the information acquisition would focus more on analysis of data rather than on their collection.

[7] No adjustment was made for risk because our data set does not allow the application of the RATS model of risk adjustment of Ibbotson (1975). Finn and Higham (1988) also show from Australian data that the application of a variant of the RATS model accounted for only 2.4% of the 28.1% initial performance computed with a market adjustment.

[8] The inclusion of secondary offerings in the studies of Veljanovski (1987) and Buckland (1987) contaminates their estimates of average underpricing. Since studies of secondary offerings of equities indicate that on average the stock price of the corporation falls (e.g. Masulis and Korwar, 1986), their estimates would be downwards biased.

Results

Positive and statistically significant average excess returns were found for both sectors for most holding periods (Table 1, panel A). For the first day of trading, the excess returns were 45.1% and 12% for the public and private sectors respectively. These findings apply to individual companies with the exception of two from the public sector and three from the private sector which had initial negative excess returns averaging 4.7% in the public sector (Britoil 7.28% and Jaguar 2.12%); and 14.2% for the private sector (TR Energy 12.9%, Amari 23.5% and Mecca Leisure 6.5%). Average excess returns of −0.6% and −0.11% were found for the second and third trading days of the public sector issues. The private sector issues showed an average excess return of −1.08% on the second day. These negative excess returns are, however, economically and statistically insignificant.

Table 1

Panel A
Excess Returns of Public and Private Sectors for Selected Days (Market Adjusted)

Day	*Public*	*Private*	*T (two-sample)*
1	45.1	12.0	2.38**
2	44.5	10.9	2.44**
3	43.4	11.6	2.30**
4	45.2	11.7	2.28**
5	45.0	11.8	2.26**
10	43.6	13.0	2.09*
20	44.0	14.5	1.90*
40	50.0	19.1	1.73*
60	54.0	19.8	1.93*
80	55.9	23.1	1.68
100	59.0	21.0	2.10*
120	64.4	17.5	1.98*
140	58.4	21.5	1.63
160	70.2	21.8	1.79*

Mean of difference between public and private sector excess returns for 160 days = 37%.

Panel B
Mann–Whitney and Boot-strapping Results (Market Adjusted)

	Mann–Whitney Test Median (%)	*Boot-strapping*[5] *Mean* (%)
Public sector	55.81	55.89
Private sector	24.0	24.24
Public less private (portfolio difference)	31.61***	31.65***

Notes

(1) The excess returns are for specified holding periods. They are equivalent to cumulative excess returns.

(2) The t statistics are computed using a two-sample t-test of differences between two means which does not require the equality of sample variances.

(3) **Significant at $P < 0.05$.

(4) *Significant at $P < 0.10$.

(5) This involved 32,000 random resamplings of the data set. It is instructive to note that the boot-strapping mean converges to the Mann–Whitney median test.

(6) ***Significant at $P < 0.00001$.

The results are shown in Table 1 for the two-sample t-test of the differences in the mean of excess returns from the two sectors, Mann–Whitney tests for the differences in their median, and the t-test of differences in the mean return available from both sectors based on a boot-strapping process. These results suggest that the excess return provided by the public sector issues is significantly greater than that available from private sector issues. Therefore, our major empirical proposition that the average excess returns of the public sector should not exceed those of the private sector could not be accepted. The public sector issues show average excess returns which significantly exceed those of the private sector both in the economic and statistical sense for the first seven weeks of trading. Figure 1a shows the excess return difference between the two sectors, with the smallest being 28.2% and the largest 49.2% with an average for all 160 days of 37% (31% with Mann–Whitney test and boot-strapping) over the 32-week period. Buying on the first day of trading produced negative excess returns (public sector) for the first five weeks (Figure 1b) while the private sector showed some holding period gains in the after-market (Figure 1c). The public sector result is consistent with our argument that the information generation activities that go with the various privatisations help to reveal the real prospects of such firms and are therefore properly priced when

---

[9] Datastream is an online financial database of share price and other company data for virtually all UK quoted companies as well as some unquoted ones. It also has company data from other stock markets.

Figure 1(a)

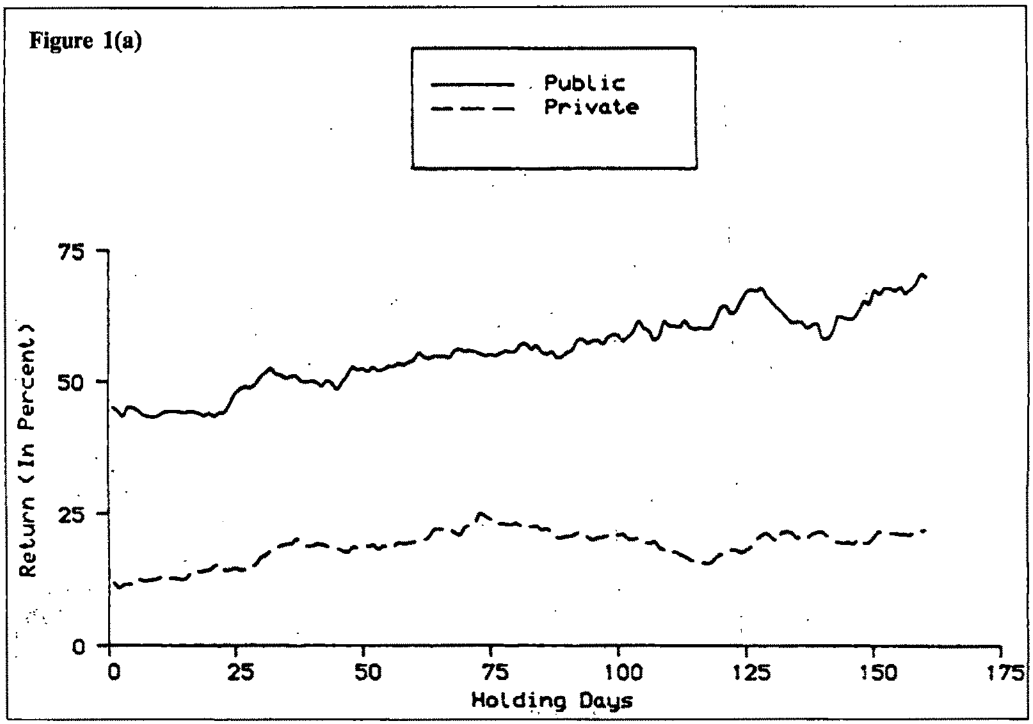
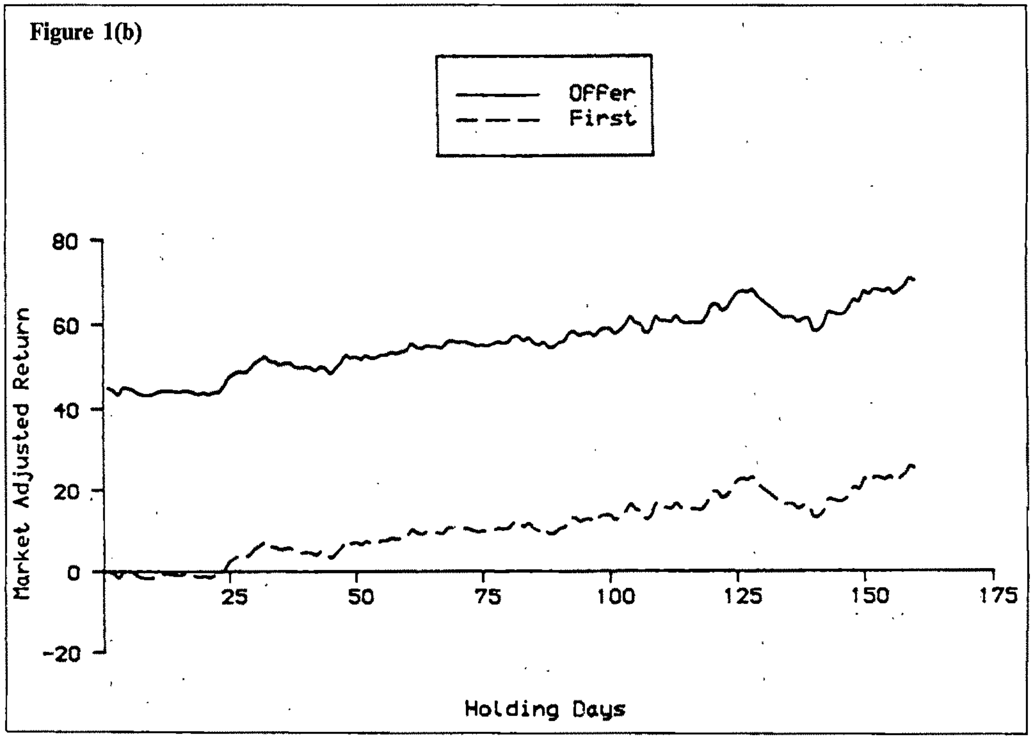


Figure 1(b)



trading commences. Positive excess returns to the private sector portfolio would be insignificant after transaction costs.[10]

To investigate whether size of issue may in part explain the magnitude of underpricing the following equation was estimated:

$$MAR_i = a + b\ (\text{Size})_i + e_i \qquad (2)$$

where size of issue was scaled by total market capitalisation of firms on the FT All Share index. Separate estimates for the two sectors, the use of dummy variables for the private and public sectors and pooled estimates all indicate that size is not

---

[10] No brokerage charges arise for the investor in applying for new shares. Such costs are generally borne by the issuer. If an investor purchases in the after-market, brokerage and other charges such as stamp duty would arise. Transaction costs of buying and selling new issues in the after-market are therefore higher.

Figure 1(c)

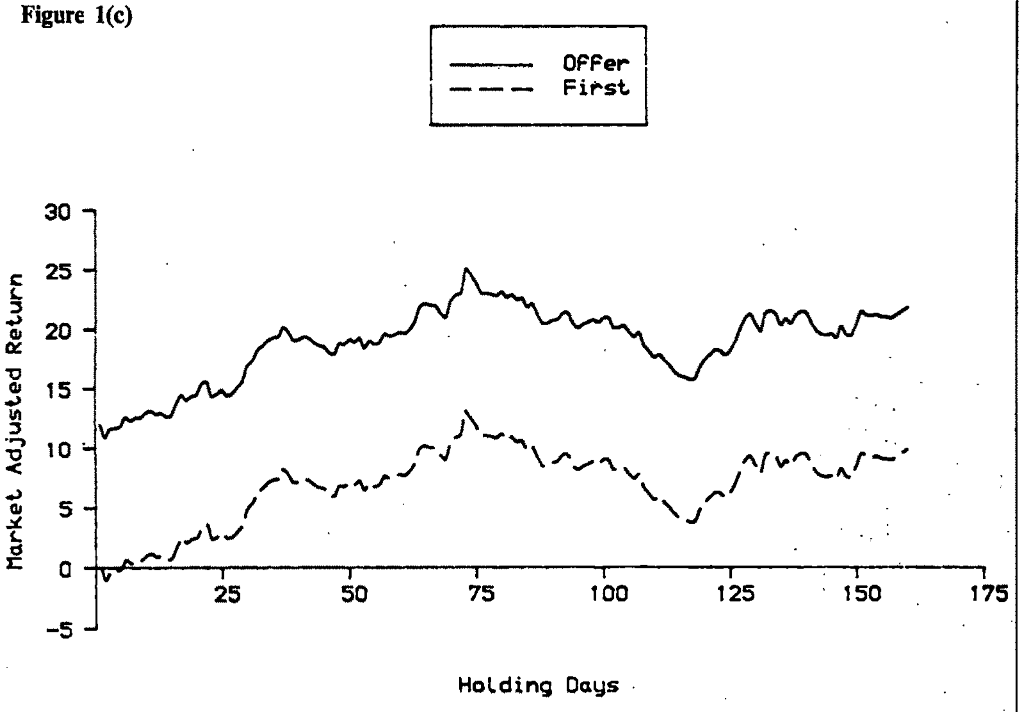


Table 2
Relationship Between Abnormal Return, Size of the Issue and Commission

Trading day	*Const*	*T-Cons*	*Size*	*T-Size*	*Comm*	*T-Comm*	AR^2
Panel A							
1	0.319*	3.42	0.0864	0.24	—	—	0.00
6	0.322*	3.39	0.1064	0.29	—	—	0.00
11	0.321*	3.23	0.134	0.35	—	—	0.00
20	0.341*	3.30	0.127	0.32	—	—	0.00
30	0.354*	2.97	0.301	0.66	—	—	0.00
60	0.416*	3.64	0.184	0.42	—	—	0.00
Panel B							
1	0.317*	2.74	—	—	0.0061	0.17	0.00
6	0.312*	2.64	—	—	0.0108	0.30	0.00
11	0.257*	2.12	—	—	0.0346	0.92	0.00
20	0.230	1.86	—	—	0.0543	1.42	0.04
30	0.274	1.89	—	—	0.0514	1.14	0.01
60	0.361*	2.57	—	—	0.0340	0.78	0.00
Panel C							
1	0.293*	2.06	0.1129	0.30	0.0093	0.24	0.00
6	0.280	1.94	0.1493	0.39	0.0150	0.39	0.00
11	0.205	1.38	0.2535	0.64	0.0418	1.05	0.00
20	0.166	1.10	0.3069	0.76	0.0630	1.57	0.02
30	0.172	0.99	0.4878	1.04	0.0653	1.40	0.02
60	0.297	1.74	0.3061	0.67	0.0427	0.93	0.00

where:
Dependent variable is abnormal return in all equations.
Explanatory variables are size of the firm (adjusted for market capitalisation) and rate of commission (Comm).
AR^2 = Adjusted R-Squared.
*Significant at 5% level.
Note: All the coefficients for size and commission are not statistically significant at any meaningful level.

a significant variable in the generation of underpricing as found in other IPO studies. Table 2a reports the pooled estimates for size on selected days.

It has also been argued that the extent to which underwriters underprice may depend on whether or not they are adequately compensated (Smith, 1977). This arises from the recognition that in a stand-by underwriting agreement, the issuing company effectively purchases a put option from the underwriter. If the underwriting commission does not reflect the full price of this option, the underwriter may obtain part of the option value from underpricing. This hypothesis has been tested by examining whether underpricing is related to a measure of risk of the underlying security such as the standard deviation of returns in the after-market (see for example Tinic, 1988; Finn and Higham, 1988). The evidence indicates that this measure of risk of the underlying security does not explain the magnitude of underpricing.

We investigate the simple implication of the hypothesis that underpricing may depend on the commission paid to the underwriter with the following equation:

$$\mathrm{MAR}_i = a + b\ \mathrm{Comm}_i + e_i \qquad (3)$$

where Comm is the commission expressed as a percentage of the total value of the shares issued at the offer price. The results in Table 2b show no relationship between the size of the issue and the rate of commission.

The results for size and commission (see Table 2c) were not altered when they were both included in a single equation to assess their impact on underpricing. We conclude that the significant differential underpricing between public and private sector issues cannot be attributed to the size of the issues and the commission charged by underwriters.

Conclusion

Our analysis of how public sector companies were privatised led to the empirical proposition that any underpricing should not differ from what is observed in the new issues market. Our results, however, show that the magnitude of underpricing in the public sector corporations significantly exceeds that of the private sector issues. Size and underwriting commission could not account for this differential underpricing. This result is strange given that one of the government's objectives in the privatisation programme is to raise revenue. The offer of an additional discount which averages about 31% above what could have been expected from private sector issues implies wealth transfers to those who have acquired the shares under the privatisation programme. Such a wealth transfer was also observed when the French government paid a premium of about 20% to nationalise some private firms in 1981–82 (Langhor and Viallet, 1986).

The analysis of after-market holding period excess returns of the public sector issues were, however, negative for about 25 days if one purchased on the first day of trading. Thus while the efficiency of the primary issue market is in doubt, we cannot reject the general conclusion that the secondary market is efficient.

References

Baron, D. P. (1982), 'A Model of the Demand for Investment Banking Advertising the Distribution Services for New Issues', *Journal of Finance*, 37, pp. 988–976.

Beatty, R. and J. Ritter (1986), 'Investment Banking, Reputation and Underpricing of Initial Public Offering', *Journal of Financial Economics*, 15, pp. 213–232.

Buckland, R., P. J. Herbert and K. A. Yeomans (1981), 'Price Discount on New Equity Issues in the UK and Their Relationship to Investor Subscription in the Period 1965–1975', *Journal of Business Finance and Accounting*, Spring, pp. 79–95.

Curwen (1986), *Public Enterprise*, Wheatsheaf Books, Brighton.

Finn, F. J. and R. Higham (1988), 'The Performance of Unseasoned New Equity Issues-Cum-Stock Exchange Listings in Australia', *Journal of Banking and Finance*, 12, pp. 333–351.

Ibbotson, R. G. (1975), 'Price Performance of Common Stock New Issues', *Journal of Financial Economics*, 2, pp. 235–272.

Koh, F. and T. Walter (1989), 'A Direct Test of Rock's Model of the Underpricing of Unseasoned Issues', *Journal of Financial Economics*, 23, pp. 251–272.

Langhor, H. M. and C. J. Viallet (1986), 'Compensation and Wealth Transfers in the French Nationalisations, 1981–82', *Journal of Financial Economics*, 17, pp. 273–312.

Masulis, R. W. and A. N. Kowar (1986), 'Seasoned Equity Offerings: An Empirical Investigation', *Journal of Financial Economics*, 15, pp. 91–118.

Myers, S. C. (1977), 'Determinants of Corporate Borrowing', *Journal of Financial Economics*, 5, pp. 147–175.

Muscarella, C. J. and M. R. Vetsuypens (1987), 'A Simple Test of Baron's Model of IPO Underpricing', *Journal of Financial Economics*, 24, pp. 125–135.

Rock, Kevin (1986), 'Why New Issues are Underpriced?', *Journal of Financial Economics*, 19, pp. 187–212.

Ritter, J. R. (1985), 'The Hot Issue Market of 1980', *Journal of Business*, 57, pp. 215–240.

Smith, C. W. Jnr. (1977), 'Alternative Methods of Raising Capital', *Journal of Financial Economics*, 4, pp. 273–307.

Tinic, S. M. (1988), 'Anatomy of Initial Public Offerings of Common Stock', *Journal of Financial Economics*, 43, pp. 789–822.

Veljanovski, C. (1987), *Selling the State: Privatisation in Britain*, Weidenfeld and Nicolson, London.

Accounting and Business Research, Vol. 21, No. 81, pp. 57–66, 1990

Further Evidence on Accounting Choices: The South of Scotland Electricity Board, 1978–1988

W. M. McInnes*

Abstract—This study augments McInnes (1990) by investigating the effects of a small number of accounting procedures which were chosen by the management of a state-owned enterprise. It focuses on those accounting choices in the South of Scotland Electricity Board's (SSEB) set of accounting choices which were subject to criticism in a Price Commission report published in 1978. In spite of this criticism SSEB management continued to use these accounting procedures in their main set of financial statements, although in recent years some of these procedures have been changed. Estimates are provided of the multi-period and cumulative decreasing effects of the accounting procedures criticised by the Commission on the net income reported by the SSEB. The possible incentives that SSEB management may have had for continuing to use these accounting procedures in their main set of financial statements after they had been subject to criticism are identified and explored.

Introduction

In his longitudinal study of changes in the UK gas industry's set of accounting choices from 1969 to 1974, McInnes (1990) provides evidence which is consistent with the argument, derived from the positive accounting theorists (e.g. Watts and Zimmerman, 1986), that when gas industry management anticipated that the industry's reported financial performance would make it difficult to justify a price rise they made accounting changes which decreased income. Based on the arguments of Aharoni (1981) relating to the incentives faced by the managers of state-owned enterprises, McInnes suggests that gas industry management may have had incentives to provide justification for price rises through income-decreasing accounting choices so as to increase the industry's cash inflows and hence management's relative autonomy from the unpredictable world of politics. McInnes demonstrates that the accounting changes made by gas industry management not only had a major effect in decreasing the reported income for the year during which the changes were made but also had a major effect in decreasing the reported income of the subsequent years of the quinquennium studied. Thus the justification for a price rise in subsequent years was also improved. He concluded that, to the extent that the effect of accounting changes on the reported income of subsequent years can be predicted by managers, there may be greater incentives to make accounting changes than has so far been argued by the positive accounting theorists.

In a similar manner to McInnes (1990), this paper focuses on the accounting choices made by the management of a state-owned enterprise, the South of Scotland Electricity Board (SSEB).[1] In this case, the focus is not on accounting changes, but on those accounting choices in the SSEB's set of accounting choices which were subject to criticism in a Price Commission report published in July 1978 (Price Commission, 1978). In spite of the Price Commission's criticisms, the Secretary of State for Scotland (the SSEB's sponsor minister) made it clear almost immediately after the Commission's report was published that he had no intention of issuing a general direction to the SSEB to change its accounting procedures (953 HC Deb 1977/78, Col. 678,

---

*The author is senior lecturer in accounting at the University of Strathclyde. He is grateful to Euan Hutchinson, Andrew Marshall and Morag Robertson for their help at various stages of this project and to Professor Chris Nobes, University of Reading and Professors Peter Pope and Tony Puxty, University of Strathclyde for helpful comments on the paper. The remaining imperfections in the paper are, however, the responsibility of the author.

[1] The SSEB has responsibility for the generation, transmission and distribution of electricity in the South of Scotland. Its territory extends to approximately 21,000 square kilometres including Scotland's industrial belt and has a population of more than 4 million. The SSEB's sponsoring department is the Scottish Office. In a Scottish context the SSEB is large: in a 1987 ranking of the top 100 Scottish companies the SSEB was ranked eighth on turnover and fourth on total assets (*Scottish Business Insider*, January 1987).

Written Answers). This announcement appears to be consistent with the evidence provided to the Select Committee on Nationalised Industries (1968, Annex 3, para. 10) reported in McInnes (1990) that any directions are in general terms 'and leave the boards considerable latitude in deciding the precise form in which the accounts are published'. The accounting procedures which had been criticised by the Price Commission continued to be used by SSEB management in their main set of financial statements. This paper provides estimates of the multi-period and cumulative effects of the choices of accounting procedures criticised by the Price Commission on the net income reported in the SSEB's main set of financial statements and suggests why SSEB management may have continued to use these accounting choices.

Notification of price rise by the SSEB

As a result of the Price Commission Act 1977 the SSEB, like most large organisations in the UK, had to notify the Price Commission of its intention to increase prices. As a result of any such notification the Price Commission had the power to investigate the need for a price rise. In early 1978 the SSEB notified the Price Commission that it proposed to increase prices by an average of 9.9% from 1 April 1978. The Price Commission decided to investigate the need for that price rise and published its report in July 1978. The report (para. 2.5) pointed out that:

> In preparing tariffs the SSEB estimate the amount of electricity that is likely to be required in the coming financial year, and calculate the total costs of generation and supply. The resultant sum of money, modified with reference to the Board's financial target for that year, is the amount they seek to recover through the various tariffs.

When notifying the Price Commission of the price rise proposed from 1 April 1978 the SSEB submitted estimates of its income and expenditure for the year ended 31 March 1979. These estimates are shown in Table 1.

Table 1
SSEB Financial Estimates for Year Ended 31 March 1979

	1978–1979 (before increase notified, including fuel clause recoveries) (1)	*Effect in 1978–1979 of increase notified (2)*	*1978–1979 (after increase notified) (1)+(2)=(3)*
	£million	£million	£million
Income			
Sales of electricity	412.6	28.0	440.6
Other*	0.9	—	0.9
Total	413.5	28.0	441.5
Expenditure			
Fuel	232.6	—	232.6
Interchange and purchase of electricity	(34.5)	—	(34.5)
Materials, goods and services	49.4	—	49.4
Salaries	53.6	—	53.6
Rates	12.1	—	12.1
Depreciation—			
historic cost	44.6	—	44.6
40% additional	17.8	—	17.8
Interest	66.0	(0.8)	65.2
Total	441.6	(0.8)	440.8
Surplus/(deficit) on electricity trading	(28.1)	28.8	0.7
Contracting and sales of appliances (deficit)	(0.7)	—	(0.7)
	(28.8)	28.8	—
Units sold		18,540 m	

*Excluding Contracting and Sales of Appliances.
Source: Price Commission (1978, p. 7).

The SSEB had a statutory duty to break even (Electricity Reorganisation (Scotland) Act 1954).[2] In the absence of this statutory duty being superseded by a financial target set by the Government as had been recommended in each of the White Papers on the nationalised industries (Treasury, 1961, 1967 and 1978), SSEB management used the statutory requirement to break even as the target for 1978/79 when justifying the price rise from 1 April 1978, as can be seen from Table 1.

The Price Commission expressed concern (para. 4.33) that the SSEB did not relate their prices to long-run marginal costs as recommended in the 1967 White Paper (Treasury, 1967) and reaffirmed in the 1978 White Paper (Treasury, 1978). However, the Commission did recognise that doing so would present the SSEB with practical difficulties (paras. 4.35 and 4.36) and recommended further in-depth study of its pricing policy by the SSEB and the government (para. 4.38). The Commission accepted that the SSEB's pricing policy at that time was based on total costs, as Table 1 shows, and that as a result the Board's choices of accounting procedures affected prices. It therefore decided to investigate the SSEB's accounting choices.

Effects of the accounting choices criticised by the Price Commission

The Price Commission considered that certain of the accounting procedures chosen by SSEB management were inappropriate. This section describes the choices of accounting procedures which were criticised by the Price Commission and the calculations made of the estimated effects on the net income reported in the SSEB's main set of financial statements of SSEB management continuing to use these accounting procedures rather than adopting procedures which would have been acceptable to the Price Commission. The estimated effects on the SSEB's reported income from 1978/79 to 1987/88 are shown in Table 2. The calculations are based on the information provided in the published accounts which did not always provide sufficient detail for the purpose. Where this was the case, best estimates have been made based on the available information.

Conservative Asset Lives

The Commission reported that they had asked the SSEB to make a technical evaluation of the operating lives of their assets (para. 4.9). The Commission then compared the resulting estimated operating lives with those used for depreciation purposes as shown in Table 3. As can be seen the estimated operating lives were at that time between 17% and 50% greater than those used for depreciation purposes. The Price Commission expressed the view that the use of such conservative asset lives was not appropriate for a low risk industry such as electricity (para. 4.10).

In order to calculate the amount of 'excess' historical cost (HC) depreciation that had been charged each year as a result of adopting conservative asset lives instead of the estimated operating lives provided to the Price Commission, it was necessary to apportion the annual depreciation charge over the asset categories shown in Table 3. The published accounts did not provide adequate information for this purpose and consequently various assumptions had to be made. In the published accounts the depreciation charge on conventional and gas turbine power stations was combined. This was apportioned on the basis of the maximum available megawatt capacity in each category. The accounts only disclosed the total depreciation on the transmission assets and on the distribution assets, respectively. These were apportioned over the asset categories shown in Table 3 after taking into account both the cost and the book life of each asset category. The excess HC depreciation for each category of asset was then calculated as follows:

Depreciation Charge—

$$\text{Depreciation Charge} \times \frac{\text{Book Life}}{\text{Operating Life}}$$

In making the calculations as described above it was assumed that the estimates of operating lives did not change from 1978 until the book lives were changed.

The results of these calculations for each year are shown in Table 2. It must be emphasised that, as a consequence of the apportionments described in the previous paragraph, these are only rough estimates, but arguably they give some indication of the effect of using conservative asset lives. The reason for the reduction in the excess HC depreciation from 1984/85 is that, in that year, the use of conservative asset lives was abandoned for nuclear power stations and for the major coal-fired power stations at Cockenzie and Longannet. The further reduction in 1987/88 reflects the abandonment of the use of conservative asset lives for non-generation assets. Thus by 1987/88 the only assets whose lives had not been increased since the Price Commission report in 1978 were the smaller power stations.

It should be noted that the asset lives adopted for accounting purposes in 1984/85 and 1987/88 were not in general the same as the estimates of operating lives made in 1978. It is, of course, to be expected that SSEB management would, over time,

---

[2] In March 1979 the Electricity Reorganisation (Scotland) Act 1954 was superseded by the Electricity (Scotland) Act 1979 but the statutory requirement to break even remained unchanged.

Table 2
Estimated Multi-period and Cumulative Effects of the Accounting Choices Criticised by the Price Commission

Historical cost accounts	*1978/ 1979* £ *Million*	*1979/ 1980* £ *Million*	*1980/ 1981* £ *Million*	*1981/ 1982* £ *Million*	*1982/ 1983* £ *Million*	*1983/ 1984* £ *Million*	*1984/ 1985* £ *Million*	*1985/ 1986* £ *Million*	*1986/ 1987* £ *Million*	*1987/ 1988* £ *Million*	*Total* £ *Million*	*Percentage* %
Conservative asset lives	(11.0)	(11.1)	(11.7)	(12.7)	(14.4)	(16.1)	(7.2)	(8.7)	(9.5)	(0.8)	(103.2)	(14.1)
Profits on the disposal of assets credited to depreciation provision in balance sheet	(0.8)	(0.4)	(0.7)	(1.0)	(1.2)	(1.4)	0.0	0.0	0.0	0.0	(5.5)	(0.8)
Capital contributions from customers credited to depreciation provision in balance sheet and not released to revenue	(0.6)	(0.6)	(0.8)	(0.9)	(1.1)	(1.3)	0.0	0.0	0.0	0.0	(5.3)	(0.7)
Interest on borrowing for construction work charged to revenue	0.0	(1.3)	(2.5)	(8.0)	(19.2)	(35.8)	(59.3)	(78.9)	(94.7)	(105.6)	(405.3)	(55.4)
Additional/supplementary depreciation	(17.7)	(17.8)	(18.7)	(20.5)	(23.7)	(26.5)	(18.5)	(21.8)	(22.2)	0.0	(187.4)	(25.6)
Total effect of accounting choices	(30.1)	(31.2)	(34.4)	(43.1)	(59.6)	(81.1)	(85.0)	(109.4)	(126.4)	(106.4)	(706.7)	(96.6)
HC based reported net income	9.5	0.1	16.5	17.2	20.4	16.1	(30.5)	21.8	23.1	(69.4)*	24.8	3.4
HC based net income if above accounting choices had been changed as recommended by the Price Commission	39.6	31.3	50.9	60.3	80.0	97.2	54.5	131.2	149.5	37.0	731.5	100.0
Supplementary current cost accounts												
Current cost loss reported in supplementary statements	(45.0)	(82.0)	(46.0)	(51.0)	(42.0)	(52.0)	(141.0)	(69.0)	(73.0)	(177.0)	(778.0)	

*The 1987/1988 reported net income is not strictly comparable with that of other years as a number of accounting changes were made in that year which are outwith the focus of this paper.

Table 3

Comparison of Book and Estimated Operating Lives for SSEB's Assets

	Book lives (Years)	*Current estimates of operating lives (Years)*	*% increase*
Generation Assets			
Conventional power stations, including Hydro	25	35 (exclud. Hydro)	40
Gas turbine power stations	15	20	33
Nuclear power stations	20	25	25
Transmission assets			
Substations	25	35	40
Overhead and underground mains	30	40	33
Distribution, Contracting and Sales of Appliances, Research, General Administration			
Land and Buildings	40	60	50
Plant and Machinery	25	35	40
Overhead mains	30	35	17
Underground mains	30	40	33
Services	30	35	17
Meters and public lighting	15	20	33
Other assets, including apparatus and wiring on hire, furniture, fittings and office equipment	7	10	43

Source: Price Commission (1978, p. 15).

change their estimates of the operating lives of assets. For most categories of assets their estimates of operating lives were longer in 1984/85 and 1987/88 than they were in 1978. Consequently the estimates of excess HC depreciation shown in Table 2 are conservative relative to what they would have been if the more recent estimates of operating lives had been used instead of the 1978 estimates.

Depreciation Method

After noting that all the SSEB's fixed assets were depreciated on a straight line basis the Price Commission recommended that the Board's generation assets should be depreciated on a basis 'which more clearly reflects the actual loss of value during their operational life' (para. 4.11).

The SSEB did not make any change to its method of depreciating its generation assets until 1987/88, when Accounting Policy Note 8 pointed out that:

> The method of calculating depreciation on AGR (Advanced Gas-cooled Reactor) stations was changed from a temporal method to more closely match depreciation charges to production.... For AGR stations, the cost written off in any year is based upon the relationship between actual output for the year and the estimated remaining lifetime output from the station.

Presumably the Price Commission would have approved of this change as it would appear to satisfy their recommendation above. However, the vagueness of the Price Commission's recommendation combined with the limited information provided in the published accounts make it impossible to calculate the effects on reported income that a change from the temporal method of calculating depreciation on generation assets would have had prior to 1987/88. In any event the Price Commission (1978) thought it likely that the mix of ages of the SSEB's assets meant that the aggregate depreciation charge in any one year would not be materially affected (para. 4.11).

Profits on Disposal of Assets and Capital Contributions

The Commission considered inappropriate the SSEB's accounting practice of crediting profits on disposal of assets and capital contributions from customers to the depreciation provision in the balance sheet (para. 4.14).

Accounting Policy Note 8 to the 1984/85 published accounts stated that the treatment of profits on disposal of assets and capital contributions from customers had been changed as follows:

> Fixed assets are stated at cost less grants and consumer contributions. Profits on disposal of assets are now credited to Profit and Loss account. Grants and contributions are now released to Profit and Loss account evenly over 40 years in respect of Distribution receipts and shorter periods for others where appropriate.

Presumably these accounting treatments of the profits on disposal of assets and capital contributions from customers would have been acceptable to the Price Commission and accordingly Table 2 shows what the effects on the SSEB's reported net income would have been if these accounting treatments had been adopted from 1978/79 to 1983/84. The amounts shown as profits on disposal of assets were disclosed in each year's published accounts. The amounts which would have been released to revenue if the accounting treatment of grants and consumer contributions described above had been adopted from 1978/79 had to be estimated from the information available in the accounts.

Interest on Borrowing to Finance Construction Work

The Commission noted that interest paid during an asset's construction period was charged as a current expense rather than capitalising it (para. 4.14). This implied that, since electricity prices were based on costs, consumers were burdened with the interest cost before the asset came into operation. In this latter context the Price Commission was particularly concerned about the interest on the enormous borrowing which would be required to finance the construction of the advanced gas-cooled nuclear station at Torness (para. 4.15).

An outline of the calculations of the interest on the borrowing required to finance the assets in the course of construction is shown in Table 4. In making these calculations it has been assumed that the internal financing ratio for each year can be used to calculate the amount of internally generated funds used to finance each year's increase in the assets in the course of construction.[3] The balance of funds required is assumed to have been raised through long-term borrowing. A weighted average interest rate on each year's new long-term borrowing has been calculated. Each year's weighted average interest rate has then been applied to the amounts assumed to have been raised through long-term borrowing each year to finance the increase in the assets in the course of construction to give the amount by which the interest charge for future years would increase as a result of that borrowing.[4] As the published accounts did not disclose the exact dates on which new long term borrowings were raised during each year, it has been assumed that all borrowings were made half-way through the year. Consequently, only a half-year's interest on the new long-term borrowing raised in a year has been included in the interest charge for that year. The amount of interest charged each year on the borrowing required to finance assets in the course of construction must obviously take into account the interest on all such borrowings up to the end of each year. The figures in the last column of Table 4 are reproduced in Table 2.

Additional or Supplementary Depreciation

The Price Commission was critical of the additional depreciation charge which the SSEB made for the first time in its 1977/78 profit and loss account. In the balance sheet, this additional depreciation was not used to reduce the book value of the fixed assets, which were shown on an HC basis, but was transferred to a separate reserve described as an additional depreciation reserve. The SSEB justified the additional depreciation charge partly on the basis that the Price Code in force at that time allowed the SSEB to uplift its HC depreciation charge by 40% when applying for a price rise and partly on the basis that it was a move towards current cost accounting. The Price Commission considered the additional depreciation charge to be inappropriate (para. 11), arguing that the charge itself:

> has an inflationary effect for by uplifting depreciation by 40 per cent of the basic amount the total cost of generating electricity increased for 1977–78 by 4 per cent, and this has passed through into prices (para. 4.4).

---

[3] Although the SSEB's Report and Accounts described certain loans as being raised specifically to finance construction work at Torness it seems likely that these loans would be used by SSEB management to increase the pool of funds available for all purposes including, of course, construction work at Torness.

[4] This assumes that all the SSEB's long-term borrowings were at fixed rates of interest. This was, indeed, the case until 1984/85 when the Board started to issue US$ Commercial Paper Notes which in spite of their short-term nature were included in long-term borrowing because they were continually rolled over. The average rate of interest on the Commercial Paper was 11.1% in 1984/1985, 10.5% in 1985/1986 and between 10% and 11% in 1986/1987 and 1987/1988. The estimated interest charges for 1985/1986, 1986/1987 and 1987/1988 have been reduced to take into account the reduction in the rate of interest on the funds initially raised in 1984/1985. As with the SSEB's other foreign currency loans the exchange rate risk was borne by the Treasury.

Table 4

Calculation of Interest on Borrowing for Construction Work

Year	*Increase in assets in the course of construction (note 1)*	*Internal financing ratio (note 2)*	*Internally generated funds*	*Externally generated funds*	*Weighted average interest rate on long-term borrowing*	*Increase in interest charges for future years*	*Estimated interest charge for construction work*
	£m	%	*£m*	*£m*	%	*£m*	*£m*
1979/1980	35.8	49.0	17.5	18.3	13.5	2.5	1.3
1980/1981	79.2	119.7	79.2	—	—	—	2.5
1981/1982	138.8	51.5	71.5	67.3	16.17	10.9	8.0
1982/1983	253.3	60.1	152.2	101.1	11.48	11.6	19.2
1983/1984	347.1	42.0	145.8	201.3	10.73	21.6	35.8
1984/1985	315.5	27.4	86.4	229.1	11.1	25.4	59.3
1985/1986	256.0	39.0	99.8	156.2	10.52	16.4	78.9
1986/1987	250.0	37.9	94.8	155.2	9.76	15.1	94.7
1987/1988	123.0	39.3	48.3	74.7	9.13	6.8	105.6
	1798.7		795.5	1003.2			405.3

1. The increase in the assets in the course of the construction was disclosed in the Notes to the Accounts from 1983/1984 to 1987/88. The 1983/84 Note disclosed the amount of assets in the course of construction up to 31 March 1983 which was then allocated over the previous four years in proportion to the additions to nuclear generation assets in each of these years. The main construction work at Torness began in 1979/1980.

2. The internal financing ratio for each year was obtained from the Statistical Supplement to the SSEB's Report and Accounts 1987/1988 (p. 9).

The SSEB continued to make an additional depreciation charge in its profit and loss account up to 1982/83. However, the 1983/84 accounts were prepared in accordance with a revised Direction from the Secretary of State for Scotland dated 21 May 1984. As a result of specific references in that Direction to the need to comply with the requirements of the Companies Acts and Statements of Standard Accounting Practice the SSEB:

> are now obliged to treat supplementary depreciation as an appropriation of profits instead of a charge made before arriving at operating profit (SSEB Report and Accounts 1983/84, p. 15).

In the SSEB's 1983/84 profit and loss account, the term 'supplementary depreciation' was used instead of 'additional depreciation' and was shown as the last item deducted in arriving at the 'surplus for the year'. In the balance sheet the term 'supplementary depreciation' was used to describe the reserve. These changes in 1983/84 appeared to lack substance[5] as the focus of attention was still the surplus after deducting the extra depreciation (e.g. SSEB Report and Accounts 1983/84, pp. 8, 9 and 12). The SSEB continued to deduct supplementary depreciation each year until 1987/88 when the practice ceased and the balance on the supplementary depreciation reserve at the beginning of the year was transferred to general reserve. No explanation was provided for this change of practice in 1987/88.

The amounts of additional/supplementary depreciation deducted in the SSEB's profit and loss account from 1978/79 to 1986/87 are shown in Table 2. The reported net income figures shown in Table 2 for each of these years are after the deduction of additional/supplementary depreciation.

Historical Costs

The Price Commission was critical of SSEB management for preparing their financial statements on a HC basis as:

> depreciation which is calculated on that basis does not adequately reflect the impact of changing price levels (para. 4.13).

The Commission recognised that most of the other accounting choices which it had criticised 'mitigated the limitations of an HC valuation of assets in a time of inflation' (para. 4.14). Nevertheless the

---

[5] The auditors, Deloitte Haskins and Sells, considered that the true and fair view given by the accounts was affected by the additional depreciation charge but not by the appropriation of supplementary depreciation. In the Auditors' Reports from 1977/1978 to 1982/1983 they pointed out that, in their opinion, the additional depreciation charge was inconsistent with the HC basis of preparing accounts and fell short, by an amount which they specified each year, of the additional provision required on a current cost basis. In their Reports from 1983/1984 to 1986/1987 the appropriation of supplementary depreciation was not mentioned.

Commission recommended that the SSEB's depreciation charge be calculated:

> on a replacement cost basis, using the modern equivalent asset approach with due allowance for operating cost savings on replacement plant and realistic asset lives and with a gearing adjustment (para. 4.37).

It has not been possible to calculate what the depreciation charge would have been using the Price Commission's recommended approach as insufficient information is publicly available.

However, in 1978/79 and 1979/80, SSEB management did publish a supplementary current cost (CC) profit and loss account in accordance with the Hyde guidelines and, from 1980/81, they published a supplementary CC profit and loss account and balance sheet in accordance with SSAP 16. These supplementary statements were not prepared on a basis which was consistent with the Price Commission's recommendations for asset valuation, as indexation was used rather than the modern equivalent asset approach. Furthermore, in accordance with the SSAP 16 recommendations for the nationalised industries, a gearing adjustment was not made. However, estimated operating lives were adopted instead of conservative asset lives, profits on disposal of assets and a proportion of the capital contributions from customers were credited to the CC depreciation charge and, of course, there was no deduction for additional/supplementary depreciation. Thus, of the accounting choices shown in Table 2 which SSEB management continued to use in their main set of financial statements, only the interest on the borrowing to finance the assets in the course of construction received consistent accounting treatment in the supplementary CC financial statements. The CC losses calculated in accordance with the Hyde guidelines and SSAP 16 are shown in Table 2. Although these CC losses were not calculated on a basis which was consistent with the Price Commission's recommendations they do provide an indication of the extent to which the reported net income of the SSEB would be decreased as a result of adopting a CC basis instead of an HC basis.

Multi-period and Cumulative Effects

The accounting choices in the SSEB's HC accounts which were criticised by the Price Commission in 1978 had major decreasing effects on the HC based reported net income of the SSEB over the following ten years. As Table 2 shows, if these choices of accounting procedures had been changed in 1978/79 the reported net income in the SSEB's HC accounts for these ten years would have totalled approximately £731.5m instead of the £24.8m which was actually reported (i.e. reported income was reduced by 96.6%). Thus this paper provides a further example of the major multi-period and cumulative effects that a small number of accounting choices can have on reported income.

The reduction in the total HC based reported net income for the ten years was to a large extent caused by three of the accounting choices criticised by the Price Commission: the use of conservative asset lives (14.1%); the charging to revenue of the interest on the borrowings required to finance the construction work at Torness nuclear power station (55.4%); and the deduction for additional/supplementary depreciation (25.6%). As can be seen in Table 2, each of these accounting choices had multi-period decreasing effects on the SSEB's reported income. The overall effects of these accounting choices did not begin to reverse (i.e. to have an income-increasing effect) during the ten years of the study. Nevertheless, the use of conservative asset lives must have had an income-increasing effect for those assets whose depreciation lives were completed during the ten years. For instance, during 1984 both reactors at Hunterston 'A' magnox nuclear power station completed their full depreciation life of 20 years (SSEB Report and Accounts 1984/85, p. 21). However, it was not possible to conduct the investigation at the individual asset level as insufficient information was provided in the published accounts. The effect of the charge to revenue of the interest on the amounts borrowed to finance the construction of assets did not reverse during the ten years because the major asset in the course of construction was Torness nuclear power station which was not commissioned until 1988/89. As the SSEB did not depreciate new power stations until they were commissioned, reversal of this accounting choice would only begin in 1988/89 when the depreciation on Torness must have been calculated on a capital cost which was smaller than it would have been if the interest on the borrowings to finance the construction work had been capitalised. The deduction for additional/supplementary depreciation would not have automatically reversed as it was credited to an additional/supplementary depreciation reserve in the balance sheet. However, as already noted, this practice ceased in 1986/87.

The preparation of supplementary CC information on a basis which was consistent with the recommendations of the Hyde guidelines and then later SSAP 16 resulted in the reporting of CC losses each year. As can be seen from Table 2 the total CC losses reported in the supplementary financial statements for the ten years amounted to £778m. However, as already noted, the SSEB's CC statements were not prepared on a basis which was consistent with the Price Commission's recommendations.

Possible incentives of SSEB management in 1978–1980

This section explores the incentives that SSEB management may have had for continuing to use the accounting procedures criticised by the Price Commission in their main set of financial statements. The Commission's report was published in July 1978. It is assumed that, if SSEB management had been intending to change these accounting procedures as a direct result of the Commission's criticisms, they would have done so either for the year during which the report was published (1978/79) or for the following year (1979/80).

In February 1979 the Secretary of State for Scotland announced that after taking into account a number of factors including 'the importance at the present time of containing inflation' he had set the SSEB:

> the target of achieving break-even on revenue account in the financial year 1979–80 after depreciation and interest. Depreciation is to be charged in accordance with the Board's current accounting practices . . . (963 HC Deb 1978/79, col. 306, Written Answers).

The comment by the Secretary of State about the importance of containing inflation presumably indicated that he did not want the general level of prices increased by a large price rise from the SSEB and that he had taken this into account when setting the above financial target. In March 1979 SSEB management justified price rises averaging 9% from April 1979 on the basis that they were required in order to achieve the financial target for 1979/80 (SSEB Report and Accounts 1978/79, p. 12).

As Table 1 shows, there was at that time a direct relationship between the financial target set by the Government and the level of prices which could be charged by the SSEB. Thus, once the Government had announced the 1979/80 financial target and the accounting practices which were to be used, SSEB management would have had to use that target and these accounting practices when justifying the April 1979 price rise to the Price Commission. The 1978 White Paper (Treasury, 1978, para. 75) pointed out that the Government had asked the Commission to take account of any financial target which the Government had set when examining any price rise which was proposed by a nationalised industry. Thus it would not have been possible for SSEB management to justify a higher price rise by adopting CC accounting procedures as the financial target had not been set on this basis by the Government.

From a financial reporting perspective, SSEB management presumably had incentives to continue to use their existing accounting practices in their main set of financial statements. As Table 2 shows, if the HC basis had been retained but all the other accounting practices criticised by the Price Commission changed, the SSEB's reported net income would have been £39.6m for 1978/79 and £31.3m for 1979/80. SSEB management may have felt that it would be embarrassing to report these net income figures as they had justified price rises from April 1978 and from April 1979 on the basis that these rises were required in order to achieve only break-even positions for each of these years. There would not appear to have been any incentives for SSEB management to adopt CC practices in their main set of financial statements. As already noted these accounting practices could not be used in a pricing context for 1979/80. In addition, SSEB management may have felt, as Likierman (1983, p. 31) suggests for several nationalised industries including the SSEB, that the image of the Board would have been damaged if CC losses (Table 2) were reported in the main set of financial statement.[6] In any event it was not generally accepted accounting practice in 1978/79 and 1979/80 for UK firms to prepare their main set of financial statements on a CC basis (Skerratt, 1980, section 28).

When considering changes to the accounting choices criticised by the Price Commission, SSEB management may also have taken into account the effects on the reported net income of subsequent years. As can be seen from Table 2, if SSEB management continued to use the HC basis for the main set of financial statements but changed the other accounting choices criticised by the Price Commission, there would have been a major increase in the net income reported for each year up to and including 1987/88. To the extent that SSEB management was able to predict these effects on subsequent years they may have had further incentives not to make these changes to the HC accounts as the resulting major increases in reported net income of subsequent years might have made the justification of price increases for these years more difficult. Similarly, to the extent that SSEB management was able to predict the CC losses shown in Table 2 for each year up to and including 1987/88 they may have had further incentives not to adopt a CC basis for the main set of financial statements because of the adverse effect on the image of the SSEB over these years.

---

[6] SSEB management may have been particularly concerned about their image at this time, given the substantial funding which was going to be required to finance the construction work at Torness. During the 1980s the SSEB substantially increased its borrowing from a variety of sources, including the National Loans Fund, the European Investment Bank, the European Atomic Energy Community and from the issue of US$ Commercial Paper.

Conclusions

The study provides direct evidence of the link which can exist between the prices charged by a state-owned enterprise and the accounting choices used in that enterprise's published financial statements. The SSEB's estimates of expenditure shown in Table 1, which were used to justify the April 1978 price rise to the Price Commission, were increased by certain accounting choices which were criticised in the ensuing Price Commission report. Thus, *ceteris paribus*, the prices charged from April 1978 must have been higher than they would have been if these accounting procedures had not been adopted. A similar argument can be made in regard to the prices charged from April 1979. A further direct link between prices and accounting choices is provided by the evidence relating to the charge for additional depreciation. This charge was first made in the 1977/78 published accounts of the SSEB. Its introduction was partly justified on the basis that the Price Code in force at that time allowed the SSEB to uplift its HC depreciation by 40% when applying for a price rise. The Price Commission pointed out that, for 1977/78, the additional depreciation charge had increased accounting costs by 4% and that this had affected the prices charged. As can be seen from Table 1 the estimated additional depreciation increased the 1978/79 accounting costs by more than 4% which, as suggested above, presumably increased the April 1978 price rise. By providing direct evidence of the link between the prices charged by a state-owned enterprise and the accounting choices made in its published accounts this study provides stronger evidence than McInnes (1990), where the evidence on this link was more circumstantial.

The Price Commission was critical of the HC basis on which SSEB management prepared its main set of financial statements. However, it was then (and still is) generally accepted accounting practice for UK firms to prepare their financial statements on that basis. All the accounting procedures within the SSEB's HC accounts which the Price Commission identified as being inappropriate were income-decreasing. This evidence is consistent with the arguments of the positive accounting theorists that firms which are subject to regulation of their prices have incentives to adopt income-decreasing accounting procedures in order to provide a stronger argument for a price rise. The evidence is also consistent with that in Jarrell (1979) on the accounting changes made by regulated US electric utilities between 1912 and 1922 and with that in McInnes (1990) on the accounting changes made by the UK gas industry between 1969 and 1974.

This study augments McInnes (1990) by providing further evidence of the multi-period and cumulative effects on reported income of a small number of accounting choices made by the management of a state-owned enterprise. In attempting to explain why managers choose particular accounting procedures, positive accounting theorists appear to have considered only the effects of these accounting procedures on the reported net income of one year. This study, like McInnes (1990), suggests that managers are likely also to consider the effects in subsequent years.

References

Aharoni, Y. (1981), 'Managerial Discretion' in Vernon, R. and Y. Aharoni (eds), *State-Owned Enterprise in Western Economies*, Croom Helm, pp. 184–193.

Jarrell, G. A. (1979), 'Pro-Producer Regulation and Accounting for Assets: The Case of Electric Utilities', *Journal of Accounting and Economics*, August 1979, pp. 93–116.

Likierman, A. (1983), 'Evidence on Accusations of Manipulating Profitability: Adjustments for Inflation by the Nationalised Industries 1976–1981', *Accounting and Business Research*, Winter 1983, pp. 29–34.

McInnes, W. M. (1990), 'A Longitudinal Study of Accounting Changes: The UK Gas Industry 1969–1974', *Accounting and Business Research*, Autumn, 1990.

Price Commission (1978), *South of Scotland Electricity Board—Price Increases in the Supply of Electricity*, Session 1977–1978, HC 535, HMSO.

Select Committee on Nationalised Industries (1968), *Ministerial Control of the Nationalised Industries*, Session 1967–1968, HC 371, HMSO.

Skerratt, L. C. L. (1980), *Survey of Published Accounts 1980*, ICAEW.

Treasury (1961), *The Financial and Economic Obligations of the Nationalised Industries*, Cmnd 1337, HMSO.

Treasury (1967), *Nationalised Industries: A Review of Economic and Financial Objectives*, Cmnd 3437, HMSO.

Treasury (1978), *The Nationalised Industries*, Cmnd 7131, HMSO.

Watts, R. L. and Zimmerman, J. L. (1986), *Positive Accounting Theory*, Prentice-Hall.

Accounting and Business Research, Vol. 21, No. 18, pp. 67–75, 1990

Human Information Processing and the Consistency of Audit Risk Judgments

Jerry R. Strawser*

Abstract—This research utilises the human information processing methodology to determine whether audit risk judgments are consistent with those obtained by using the audit risk model advanced by *Statements on Auditing Standards (SAS) Nos. 39 and 47*. The effects of two audit-risk specific factors (the level of algorithmic audit risk and the combination of components of audit risk) are examined. The results of analysis of variance (ANOVA) procedures and cue-utilisation indices reveal that some of the auditors' judgments are inconsistent with the multiplicative nature of the audit risk model. In addition, evidence suggests that auditors affiliated with regional and local firms may depart from the audit risk model when substandard tests of details procedures are performed. The differences noted in the judgments of Big Eight auditors and regional and local auditors indicate that modified versions of the audit risk model may be employed by auditors in different types of audit engagements.

At the conclusion of an examination conducted in accordance with generally accepted auditing standards, the auditor issues an opinion on an entity's financial statements. In issuing his opinion, some level of risk is always assumed by the auditor —the risk that the opinion issued may not be appropriate in the circumstances. The auditor designs the audit examination with the purpose of limiting this risk to acceptable levels. *Statement on Auditing Standards No. 47* (SAS No. 47) refers to this risk as 'audit risk' [American Institute of Certified Public Accountants (AICPA), 1989 (AU 312)]. To assist the auditor in controlling exposure to audit risk during the examination, the Auditing Standards Board of the AICPA has decomposed audit risk into various component risks. These efforts have resulted in *Statements on Auditing Standards* (SAS No. 39) [AICPA, 1989 (AU 350)] and SAS No. 47.

The human information processing methodology has been applied to describe a wide variety of audit judgments.[1] However, to date, little empirical research has been concerned with auditors' risk judgments. While previous studies [Jiambalvo and Waller, 1984; Daniel, 1988] have concluded that the audit risk model may not be descriptive of practice, these researchers did not investigate the factors which influenced the auditors' judgments. This paper utilises the human information processing methodology to examine the effect of two audit-risk related variables on perceptions of audit risk. Such an examination allows a comparison of the consistency of auditor judgments with the audit risk model to be made and provides insight into why these judgments may differ from those based on the audit risk model.

Audit risk

The AICPA defines audit risk as 'the risk that the auditor may unknowingly fail to appropriately modify his opinion on financial statements that are materially misstated' [AICPA, 1989 (AU 312.03)]. In other words, audit risk reflects the probability that the auditor issues an unqualified opinion when either a qualified or adverse opinion would be more appropriate. The concept of audit risk has been addressed by the AICPA in two of its pronouncements [AICPA, 1989 (AU 312 and 350)]. The 'composite' risk model resulting from these pronouncements is:

$$\text{Audit risk} = IR \times CR \times AR \times TD$$

where

Audit Risk = the risk that the auditor will fail to detect a material error that has occurred in the accounting process;

IR = the risk that a given account balance or class of transactions contains material error in the absence of internal control;

---

*The author is associate professor at the College of Business Administration, University of Houston.

[1] For reviews of this literature, see Libby and Lewis [1977 and 1982]; Ashton [1982]; and Joyce and Libby [1982]. In addition, Choo [1983] provides a suggested methodological extension for using the human information processing methodology to examine auditor judgments.

CR = the auditor's assessment of the risk that the internal control structure fails to prevent or detect a material error that has occurred;

AR = the auditor's assessment of the risk that analytical procedures and other relevant substantive tests would fail to detect errors that occur and are not prevented or detected by the internal control structure; and

TD = the risk that substantive tests of details will fail to detect errors, given that errors occur and are not detected by the internal control structure or analytical procedures and other relevant substantive tests.

In summary, the above model describes audit risk as the risk that (1) a material error occurs (IR), (2) is not detected or prevented by the entity's internal control structure (CR), (3) is not detected by analytical procedures and other relevant substantive tests (AR), and (4) is not detected by substantive tests of details procedures (TD). In applying this model to practice, the auditor first decides upon the level to which audit risk is controlled. While no explicit guidance is provided about actual levels of audit risk, both previous research [Jiambalvo and Waller, 1984; Daniel, 1988] and examples illustrating audit risk [AICPA, 1989 (AU 350)] indicate that lower levels (such as five and ten per cent) are most appropriate.

Next, IR and CR are assessed based on the susceptibility of the account balance to misstatement and the effectiveness of the entity's internal control structure in preventing and detecting errors, respectively. Finally, after assessing the planned extent and effectiveness of the analytical procedures (AR), the auditor uses this model to determine the nature, timing, and extent of his substantive tests of details (TD). To achieve lower levels of audit risk (*ceteris paribus*), the auditor needs to plan more effective substantive tests of details procedures (lower TD risk). As noted earlier, previous research provides evidence that the audit risk model may not be strictly applied in practice.

To date, much of the literature related to audit risk has focused on the components of the audit risk model. Beginning with Ashton's [1974] initial study, much of this literature examined the auditor's evaluation of an entity's internal control structure. Along with Ashton [1974], these studies [Reckers and Taylor, 1979; Ashton and Brown, 1980; Mock and Willingham, 1983; and Kaplan and Reckers, 1984] found that the presence or absence of appropriate segregation of duties had a substantial impact on the perceived effectiveness of an entity's internal control structure. In addition, several of these studies used the human information processing methodology (which is utilised in this research) to investigate auditor judgments.

Colbert [1988] used the human information processing methodology to examine auditors' judgments of inherent risk (IR) during the audit examination. Based on Brumfield, Elliot, and Jacobson [1983], Johnson [1983], and Willingham and Wright [1984], a set of four inherent risk factors was identified. Colbert's results indicated that these factors (turnover of the controller, financing pressure, the amount of overhead associated with inventory, and the quality of personnel) accounted for a large per centage of the variance in the perceived inherent risk associated with the inventory account.

In an empirical investigation of the audit risk model, Jiambalvo and Waller [1984] examined the effects of decomposition on auditors' assessments of tests of details risk (TD).[2] After reviewing an audit scenario, subjects were asked to assess audit risk, control risk (CR), analytical review risk (AR), and tests of details risk (TD). The subjects' assessments of TD were compared with the TD computed mathematically using the audit risk model. Jiambalvo and Waller found significant differences between the assessments of TD and the TD computed based on the assessments of audit risk, CR, and AR. In a similar study, Daniel [1988] empirically examined the audit risk models advanced by the AICPA and the Canadian Institute of Chartered Accountants [CICA, 1980] by requesting that subjects provide percentage estimates of IR, CR, AR and TD and then a holistic assessment of overall audit risk. Daniel's findings indicated that the holistic assessments of overall audit risk were significantly different from (higher than) the algorithmic risk based on the combination of the assessed components.

The above findings raise certain questions concerning the consistency of auditors' risk judgments with the audit risk model as well as the appropriateness of the audit risk model as a framework for decomposing audit risk. However, these studies do not provide evidence about the manner in which the auditors' risk judgments were made (i.e., what factors influenced the levels of perceived audit risk?). In addition, these studies focused on the audit risk judgments of auditors affiliated with large (primarily Big Eight) accounting firms. An exploratory examination of audit risk judgments using the human information processing methodology may provide some initial evidence about the manner in which audit risk judgments are made by auditors affiliated with different sized accounting firms. This issue is the focus of the current study.

---

[2] Decomposition is said to improve problem solving by forcing the decision maker explicitly to consider relevant information. This principle is relevant to the current study because of the decomposed nature of the audit risk models. See Raiffa [1968]; Einhorn [1972]; Armstrong, Denniston, and Gordon [1975]; Slovic, Fischhoff, and Lichtenstein [1977]; and Lyness and Cornelius [1982] for examples of the application of the decomposition principle in a variety of judgment settings.

Methodology

Variables of Interest

To examine the extent to which auditors' judgments are consistent with those obtained using the audit risk model, it is necessary to determine the effect of (1) the level of 'algorithmic' (mathematical) risk and (2) the individual components of the audit risk model on the perceived level of audit risk. This requirement identified the two independent variables of interest in this research: (1) the level of algorithmic risk (LAR); and (2) the combination of components (COMB) for a given level of algorithmic risk.[3] The 'composite' audit risk model, described in the previous section (Audit risk = IR × CR × AR × TD) was used in this research [Leslie, 1984; Daniel, 1988].

The two audit risk variables were manipulated by presenting the subjects with pre-answered estimates of IR, CR, AR, and TD. The levels of the component risks used to manipulate LAR and COMB in this research are shown in Table 1. As shown in Table 1, the pre-answered estimates were presented in such a manner that two distinct levels of 'algorithmic' risk (LAR) resulted from the mathematical combination of these components.[4] Nested within each level of 'algorithmic' risk, one of the three components of the audit risk model (CR, AR, or TD) was emphasised (risk was greater than the other risks). Thus, LAR was manipulated at two levels (audit risk of 9.7 per cent and 2.4 per cent) and COMB at three levels (a combination of components which contained the highest level of either CR, AR, or TD).[5] Inherent risk was held constant in all cases because of the practical difficulty associated with assessing this risk [see AICPA, 1989 (AU 350.47)].

Table 1

Levels of Component Risks Used to Manipulate LAR and COMB

LAR	9.7 per cent	2.4 per cent
COMB*		
Highest CR	CR = 0.60	CR = 0.75
	AR = 0.45	AR = 0.20
	TD = 0.45	TD = 0.20
Highest AR	CR = 0.45	CR = 0.20
	AR = 0.60	AR = 0.75
	TD = 0.45	TD = 0.20
Highest TD	CR = 0.45	CR = 0.20
	AR = 0.45	AR = 0.20
	TD = 0.60	TD = 0.75

*Inherent risk is held constant at 0.80 in all variations of the cases.

Subjects

To determine whether firm affiliation affected the consistency of audit risk judgments, the judgments of two groups of auditors were examined. The subjects were auditors affiliated with both Big Eight accounting firms and regional and local accounting firms. A total of 40 Big Eight auditors and 38 regional and local auditors participated in the study. All 78 auditors were CPAs. A profile of these subjects is presented in Table 2.

Because of the nature of audit risk judgments, this study examined the judgments of auditors at the level of senior accountant or above. The auditors participating in this research had an overall average audit experience of over six years. Of the forty Big Eight auditor respondents, 18 were managers and 22 were seniors. A total of 48 regional and local auditors completed the research instrument; the responses of ten auditors were not analysed because these subjects had not attained the level of senior accountant.

Experimental Task

The experimental task was presented to subjects in a controlled setting at two separate continuing education seminars in a large metropolitan city in the southwest United States. The experimental task was described to the subjects prior to administration, and a research assistant was present

---

[3] In addition to the two audit risk variables, the effect of two additional variables on perceived audit risk was examined in this research. These variables were: (1) the auditor's previous experience with the client (EXP) and (2) the economic conditions of the client's industry (IND). EXP is manipulated at two levels (an initial audit versus a recurring engagement); IND is also manipulated at two levels (a client operating in an industry experiencing an economic upswing versus a client operating in an industry experiencing an economic downswing). To focus on the consistency of the auditor's judgments with judgments made given the audit risk model, the discussion in this paper is limited to the audit risk variables. However, summary results for these additional variables are provided, where appropriate.

[4] The manipulation of LAR in this manner is similar to that used by Srinidhi and Vasarhelyi [1986] in a study involving internal control reliability. In this study, Srinidhi and Vasarhelyi requested auditors to assess the degree of substantive testing necessary in two separate instances: (1) given four internal control component reliabilities and a structure for aggregating these reliabilities; and, (2) given an overall system reliability comparable to that obtained by the aggregation in (1). In the current study, components of audit risk were presented to subjects. A structure for aggregating these audit risk components was not presented to subjects in this study in order to determine whether their judgments were consistent with the audit risk model.

[5] As shown in Table 1, the level of COMB was manipulated at CR, AR, or TD when that component assumed a level of either 0.75 (low risk) or 0.60 (high risk).

Table 2
Profile of Auditor-Subjects

	Big Eight (n = 40)	Regional and Local (n = 38)
Level:		
Partner	0	14
Manager	18	14
Senior	22	10
Auditing Experience:		
Average	5.65	6.68
High	11	25
Low	2	2
Previous Big Eight Experience:		
Yes	NA	22
No	NA	16

throughout to answer any questions and prevent collaboration amongst subjects. It is important to note that both Big Eight and regional and local auditors were present at each administration of the experiment, making it unlikely that any differences in the description of the task or the date of the administration were reflected in the differences between groups of auditors.

The task consisted of two parts. First, after familiarisation with the background information presented as part of the research instrument, the subjects responded to a total of 33 separate scenarios (representative audit situations).[6] In addition to information relating to (1) the previous experience of the auditor with the client (EXP variable) and (2) the economic conditions of the client's industry (IND variable), these scenarios contained pre-answered estimates of IR, CR, AR, and TD. Three random case orders were utilised; analysis of variance procedures using case order as a between-subjects variable indicated that the order of case presentation did not significantly affect the responses of either Big Eight ($p > 0.10$) or regional and local ($p > 0.36$) auditors.

Given the above information, auditors were asked to assume the role of an accountant performing a peer review of an audit conducted by an affiliate firm and to provide their estimate of the perceived level of audit risk. Audit risk was assessed on a seven point scale, with one representing a minimum level of risk and seven representing a maximum level of risk. The peer review setting was chosen to allow subjects to examine an audit engagement *ex post*. A reference case was provided to the subjects to assist them in making their responses.

In the final task, subjects were asked to allocate a total of 100 points over the four independent variables of interest (LAR, COMB, EXP, and IND). Subjects were instructed to allocate a larger number of points to those variables which they perceived to have a greater impact on audit risk. This allocation allowed the degree of self-insight possessed by the subjects to be determined.

Results

Significance of Audit Cues

To ascertain the consistency of each auditor's responses with the audit risk model, analysis of variance (ANOVA) procedures were performed. The ANOVA procedures examined the impact of the manipulated independent variables on each auditor's risk judgments. Significant variables were identified through standard F-tests using an $\alpha = 0.05$ level of significance. The overall significance of LAR and COMB based on these tests is shown in Table 3.

Table 3 illustrates the effect of LAR on the auditors' risk judgments. As shown therein, LAR had a significant effect (at $\alpha = 0.05$) on the judgments of almost 54 per cent of all auditors (42 of 78 instances). Examining Table 3 reveals that LAR had a more significant impact on the judgments of regional and local auditors (30 auditors, or 79 per cent) than on the judgments of Big Eight auditors (12 auditors, or 30 per cent). This finding indicates

Table 3
Number of Subjects' Models Showing Significant ($\alpha = 0.05$) Differences for Levels of LAR and COMB

Group	LAR	COMB	Total
Regional and Local (n = 38)	30 (78.95%)	18 (47.37%)	58[a]
Big Eight (n = 40)	12 (30.00%)	7 (17.50%)	32[b]
Total	42 (53.85%)	25 (32.05%)	

[a]Includes the significance of EXP (6 auditors) and IND (4 auditors)

[b]Includes the significance of EXP (9 auditors) and IND (4 auditors)

---

[6] These 33 cases represent: (1) a full replication of 3×2^3 experimental design (24 cases); (2) a set of warm-up cases (4 cases); and (3) a set of repeat cases (5 cases). The warm-up cases were not subjected to statistical analyses and have been utilised by previous researchers (see Ashton [1974] and Joyce [1976]). Warm-up cases are suggested by Hays [1963] and Snedecor and Cochran [1980] as possible methods which may help reduce the dependencies between repeated observations on the same subject. The repeat cases were used to determine the reliability of the auditors' judgments. The Pearson correlation for reliability in this research was 0.71 (Big Eight auditors) and 0.62 (regional and local auditors). These measures were slightly lower than those found in previous human information processing research.

that regional and local auditors appeared to make judgments more consistent with the audit risk model (i.e., were more likely to associate high levels of perceived audit risk with higher levels of LAR, and vice versa) than Big Eight auditors. The lower comparative significance of this variable on the judgments of Big Eight auditors indicates that their judgments did not consider the multiplicative nature of the audit risk model.

In addition to LAR, the effect of COMB on each auditor's judgments was examined. Any instances in which COMB had a significant impact on auditor judgments implied that auditors were influenced more by a particular component risk(s) than others. Such a finding would not be consistent with the basic premise of the audit risk model, since each component is presumed to have an equal effect on audit risk. For example, if two audit environments contain the same level of IR and AR, the audit risk model implies that an auditor would perceive an audit environment characterised by a strong internal control structure ($CR = 0.20$) and relatively ineffective tests of details procedures ($TD = 0.55$) as equally risky as one characterised by a weak internal control structure ($CR = 0.55$) and effective tests of details procedures ($TD = 0.20$).

As shown in Table 3, COMB had a significant effect on the judgments of 32 per cent of all auditors. However, separate examination by group reveals some interesting differences. For example, while COMB had a significant effect on the responses of almost 50 per cent (18 out of 38) of all regional and local auditors, this variable had only a moderate impact on the judgments of Big Eight auditors (only seven significant instances). Thus, it appears that some auditors (particularly those affiliated with regional and local firms) weighted certain component risks more heavily than others in making their risk judgments.

To determine whether a particular component was responsible for the significance of COMB, a Friedman's analysis of variance by ranks was performed. The results of this procedure indicated that, for the 18 regional and local auditors whose responses were significantly affected by COMB, high levels of TD resulted in higher perceived levels of audit risk than either high levels of CR or high levels of AR ($p < 0.005$). In fact, for these 18 auditors, 14 indicated that the highest level of audit risk existed when inadequate tests of details procedures were performed (high TD risk). For the Big Eight auditors, the highest levels of audit risk were associated with high AR risk; however, the differences between component risks were not statistically significant ($X^2 = 2.00$, $p > 0.30$).

Nonparametric Chi-square tests were also performed to determine whether the extent of significance of LAR and COMB differed for the two groups of auditors. These tests indicated that the significance of the independent variables differed for the two groups of auditors ($\chi^2 = 13.98$, $p < 0.005$).[7] As a result, evidence exists that (1) the multiplicative level of audit risk and (2) the component risks had a different impact on the judgments of auditors affiliated with Big Eight firms versus those affiliated with regional and local firms. This same analysis was separately performed for the responses of the Big Eight auditors; comparing the results for audit managers and senior accountants indicated that the position level did not affect the significance of these variables ($p > 0.10$).[8]

Taken together, these results provide conflicting evidence on the consistency of the auditors' judgments with those made using the audit risk model. Consistent with the audit risk model, the significance of LAR for a large percentage of the regional and local auditors' judgments (79 per cent) indicates that the perceived levels of audit risk were affected by the level of algorithmic risk. However, inconsistent with the audit risk model, the relatively high significance of COMB indicates that these auditors associated high levels of audit risk with one or more component risks (especially TD risk). An analysis of the Big Eight auditors' responses suggests that, based on the low significance of LAR, their judgments were not consistent with the multiplicative nature of the audit risk model. These differences in the judgments between the two groups of auditors were similar to the differences found by Firth [1980] and Shockley [1981] in the independence judgments of CPAs and chartered accountants affiliated with Big Eight firms and those affiliated with smaller firms.

Cue Utilisation

Krogstad, Ettenson, and Shanteau [1984] note that, while F-values from the ANOVA allow the statistical significance of a given independent variable to be determined, these values do not measure the strength of effect of independent variables. To evaluate the relative importance of the independent variables examined in the current study, Hays' [1963] omega-squared statistics were computed. The omega-squared statistic represents the percentage of variance in the dependent variable (perceived audit risk) explained by each independent variable. Therefore, these statistics illustrate the extent to which the auditors utilised each cue

---

[7] This same test is performed with the non-risk-related variables (EXP and IND) included. The results are almost identical ($\chi^2 = 14.371$, $p < 0.005$).

[8] Because of the varying sizes of the regional and local accounting firms whose auditors participated in this study, it was hypothesised that individuals occupying the same level in different firms would differ in terms of experience and job duties. A review of the demographic information confirmed these suspicions. Therefore, it was determined that comparing the responses of individuals occupying the various levels in regional and local firms would be inappropriate.

Table 4
Omega-Squared Statistics

	LAR	*COMB*	*Other*	*Total Interactions*	*Total*
Regional and Local					
Mean	39.89	16.48	5.06[a]	11.65	73.06
Std. Dev.	31.43	17.99	11.38	11.10	21.43
Minimum	0.00	0.00	0.00	0.00	22.14
Maximum	94.31	66.18	57.40	32.86	98.24
Big Eight					
Mean	16.48	7.43	7.82[b]	14.93	46.66
Std. Dev.	27.33	10.73	8.82	11.44	26.27
Minimum	0.00	0.00	0.00	0.00	1.43
Maximum	79.83	55.33	31.24	45.47	100.00

[a] Includes 3.85 and 1.21 for EXP and IND, respectively
[b] Includes 5.91 and 1.91 for EXP and IND, respectively

in their risk judgments. Table 4 provides summary data for the omega-squared statistics for both groups of auditors.

Comparing the omega-squared statistics for the two groups of auditors revealed that the relative importance of the four independent variables (as determined by the average omega-squared statistic) was identical for both groups of auditors. An examination of the total of the omega-squared statistics indicates that the four variables (and interactions of these variables) were utilised more extensively by regional and local auditors (total of 73.06 per cent) than Big Eight auditors (total of 46.66 per cent). These averages indicate that the auditors examined in this research (particularly Big Eight auditors) utilised the selected variables to a lesser extent than previous researchers have found in other judgment settings.[9]

To investigate whether the variable utilisation of the two groups of auditors differed, the omega-squared statistics for: (1) the total of all independent variables and interactions; (2) all independent variables; and (3) all interactions were compared. Since these statistics may not be normally distributed, the normal approximation of the Mann-Whitney U test [Daniel, 1978], corrected for ties, was used as a nonparametric analogue to the t-test. The results of this comparison indicated that regional and local auditors have significantly higher utilisations of: (1) independent variables and interactions ($p < 0.001$); and (2) independent variables ($p < 0.001$) than Big Eight auditors. Separate examinations of the utilisation of each independent variable revealed that the only significant differences were for the utilisation of LAR ($p < 0.001$). For Big Eight auditors, the level of the auditor (audit manager or senior accountant) did not significantly affect the utilisation of independent variables, interactions, or independent variables and interactions (lowest $p > 0.10$).

As illustrated in Table 4, the results of the omega-squared statistics were largely consistent with the tests of significance using the ANOVA procedures. In particular, it appeared that the level of algorithmic risk had a much larger effect on the risk assessments of regional and local auditors (average statistic of 39.89) than those of Big Eight auditors (average statistic of 16.48). Also, COMB had a greater effect on the assessments of regional and local auditors as compared to Big Eight auditors. Finally, neither group's responses were affected to a large extent by either EXP or IND.

The above results once again indicate that the judgments of regional and local auditors were more consistent with the multiplicative form of the audit risk model than those of Big Eight auditors, as these auditors associated higher levels of audit risk with higher levels of algorithmic risk. However, the relatively large utilisation of COMB by regional and local auditors also provides evidence that these auditors felt that certain components had a more substantial impact on overall audit risk than other component risks. Thus, the judgments of regional and local auditors may depart from the audit risk model in some circumstances.

Measures of Auditor-Subject Judgment

In addition to determining the consistency of the auditors' judgments with the audit risk model, several other measures of auditor judgment were evaluated in this research. These measures (consensus and self-insight) were compared with findings related to other types of auditor judgments, including: (1) internal control evaluation [Ashton, 1974; Ashton and Brown, 1980; Hamilton and Wright, 1982]; (2) the degree of necessary substantive testing [Joyce, 1976; Srinidhi and Vasarhelyi, 1986]; (3) materiality judgments [Firth, 1979; Krogstad, Ettenson, and Shanteau, 1984]; (4) inherent risk judgments [Colbert, 1988]; (5) going-concern judgments [Campisi and Trotman, 1985]; and, (6) independence judgments [Firth, 1980; Shockley, 1981].

---

[9] For example, Krogstad, Ettenson, and Shanteau [1984] found total variance explained in materiality judgments ranging from 62 per cent (accounting students) to 80 per cent (audit partners). In addition, Ashton and Brown [1980] (internal control judgments) and Joyce [1976] (substantive testing judgment) both found total variance explained of 78 per cent. Colbert [1988] found total variance explained by the main effects in an assessment of inherent risk ranging from 48 to 69 per cent for four groups of auditors, which was slightly higher than that found in this research. The above comparisons with this study should be made with care, since the task and number of variables examined in each study differed.

Consensus. Compared to other human information processing studies, the degree of consensus among auditor-subjects noted in this research was moderate.[10] Consensus was measured as the agreement between the auditors' responses and was represented by a mean Pearson correlation coefficient of 0.31 (Big Eight auditors); consensus for the judgments of regional and local auditors was higher (0.51). This difference was statistically significant ($p < 0.005$). While the consensus within levels (audit managers and senior accountants) for Big Eight auditors was higher than overall consensus, this difference was not statistically significant.

Despite the fact that the level of consensus in this research was lower than that found in other studies, a nonparametric procedure (Kendall's W) rejected the null hypothesis that the ranks of the auditors' omega-squared statistics were not associated ($p < 0.005$). This finding indicates that some degree of consensus existed among the auditors in the utilisation of the independent variables to assess audit risk.

Self-Insight. Self-insight, a measure of the degree of correspondence between the auditors' actual utilisations of the independent variables (omega-squared statistics) and their perception of the importance of these variables (subjective allocation of points over the four variables), was low in relation to other studies of auditor judgment.[11] Pearson correlation for self-insight in this research was 0.42 for Big Eight auditors and 0.47 for regional and local auditors. While regional and local auditors reported a higher degree of self-insight, this difference was not statistically significant ($p > 0.32$). For Big Eight auditors, the self-insight of managers (0.44) was slightly higher than that of seniors (0.40), but the difference was not statistically significant ($p > 0.38$).

In sum, auditors exhibited lower consensus and self-insight in their perceptions of audit risk than that found in other judgment situations. Clearly, these findings may result from the relatively recent emphasis on the task examined in this research. Auditors may have less familiarity in making assessments related to audit risk than evaluating an entity's internal control structure [Ashton, 1974; Ashton and Brown, 1980; Hamilton and Wright, 1982; Gaumnitz, *et al*, 1982]; planning substantive testing procedures [Joyce, 1976; Srinidhi and Vasarhelyi, 1986]; evaluating the materiality of certain items [Firth, 1979; Krogstad, Ettenson, and Shanteau, 1984]; going-concern judgments [Campisi and Trotman, 1985]; and evaluating the independence of the auditor [Firth, 1980; Shockley, 1981]. Colbert [1988] noted that the lower levels of consensus and self-insight obtained in the examination of inherent risk judgments may have resulted from the same source. Future research can evaluate whether consensus and self-insight increase as the knowledge of audit risk and factors affecting audit risk increases.

Conclusions

Taken together, the results of this study indicate that the judgments of regional and local auditors are more consistent with the multiplicative nature of the audit risk model than those of Big Eight auditors. This consistency was reflected by (1) the greater percentage of regional and local auditors whose judgments were significantly affected by LAR (see Table 3) and (2) the higher omega-squared statistics associated with LAR for regional and local auditors (see Table 4). Both findings indicate that regional and local auditors associate higher levels of audit risk with high levels of algorithmic risk to a greater extent than Big Eight auditors, and therefore, had judgments consistent with the nature of the audit risk model.

However, the overall significance of COMB indicates that these regional and local auditors felt that certain components (particularly TD risk) had a more substantial impact on overall audit risk than did other component risks. This finding contradicted the audit risk model and indicates that these auditors believed that: (1) substantive tests of details were more effective than analytical review procedures in detecting errors; and (2) audit environments characterised by weak internal control structures were less risky if effective substantive tests of details were applied by the auditor. Thus, it appears that regional and local auditors felt that applying effective substantive tests of details procedures was the most critical element in controlling audit risk. While the responses of Big Eight auditors indicated that these individuals felt that substandard analytical review procedures had the most substantial effect on perceived audit risk, the effect was not as significant.

---

[10] Ashton [1974] (0.70), Hamilton and Wright [1982] (0.66), Ashton and Brown [1980] (0.67), Srinidhi and Vasarhelyi [1986] (0.93), Campisi and Trotman [1985] (0.73), Shockley [1981] (0.58 for Big Eight auditors), and Krogstad, Ettenson, and Shanteau [1984] (0.74 for audit partners and 0.67 for audit seniors) found higher consensus than in the current research while Joyce [1976] (0.37), Wright [1979] (0.38), Krogstad, Ettenson, and Shanteau [1984] (0.41 for auditing students), Shockley [1981] (0.33 for non-Big Eight CPAs), and Schultz and Gustavson [1978] (0.12) found lower degrees of consensus than those of the regional and local auditors in the current research. In addition, while Firth did not measure consensus in the same manner as these studies, his results suggested that some lack of consensus existed in auditors' materiality [1979] and independence judgments [1980].

[11] See Ashton [1974] (0.89), Joyce [1976] (0.53), Slovic *et al.* [1972] (0.34), and Colbert [1988] (0.61) for the other studies examining the self-insight of subjects' judgments.

Overall, the results of this study indicate that the findings of Jiambalvo and Waller [1984] and Daniel [1988] may reflect differences in the perceived importance of the component risks. This study confirmed that auditors' (particularly Big Eight auditors) judgments were not consistent with the audit risk model and also shed some insight on how the component risks were utilised by the auditors in making their risk judgments. While the audit risk model implicitly assigns an equal weight to each component risk, the lack of more explicit guidance may have caused some of the differences discussed herein. For example, SAS No. 47 [AICPA, 1989 (AU 312.20)] notes that 'the way the auditor considers these component risks and combines them involves professional judgment and depends on his audit approach.'

The overall lack of significance and utilisation of both LAR and COMB implies that Big Eight auditors incorporated factors other than the component risks into their judgments. Future research can attempt to identify these factors. Consideration should also be given to (1) providing more explicit guidance than that in SAS No. 47 and (2) determining whether modifications to the audit risk model could make this model more useful for different-sized accounting firms and different types of audit engagements.

References

AICPA, *Professional Standards: Volume 1* (New York: AICPA, 1989).

Armstrong, J., W. Denniston, and M. Gordon, 'The Use of the Decomposition Principle in Making Judgments', *Organization Behavior and Human Performance* (October 1975), pp. 257–263.

Ashton, R. H., 'An Experimental Study of Internal Control Judgments', *Journal of Accounting Research* (Spring 1974), pp. 143–157.

Ashton, R. H., *Human Information Processing in Accounting*, Studies in Accounting Research No. 17 (Sarasota, FL: American Accounting Association, 1982).

Ashton, R. H., and P. R. Brown, 'Descriptive Modeling of Auditors' Internal Control Judgments: A Replication and Extension', *Journal of Accounting Research* (Spring 1980), pp. 269–277.

Brumfield, C. A., R. K. Elliot, and P. D. Jacobson, 'Business Risk and the Audit Process', *Journal of Accountancy* (April 1983), pp. 60–63.

Campisi, S and K. T. Trotman, 'Auditor Consensus in Going Concern Judgments', *Accounting and Business Research* (Autumn 1985), pp. 303–310.

Canadian Institute of Chartered Accountants, *Extent of Audit Testing: A Research Study*, (CICA, 1980).

Choo, F., 'Split-Plot Repeated Measures Designs in Internal Control Judgement Research: A Note', *Accounting and Business Research* (Winter 1983), pp. 83–84.

Colbert, J. L., 'Inherent Risk: An Investigation of Auditors' Judgments', *Accounting, Organizations and Society* (Vol. 13, No. 2, 1988), pp. 111–121.

Daniel, S. J., 'Some Empirical Evidence About the Assessment of Audit Risk in Practice', *Auditing: A Journal of Practice and Theory* (Spring 1988), pp. 174–181.

Daniel, W. W., *Applied Nonparametric Statistics* (Boston: Houghton Mifflin Company, 1978).

Einhorn, H., 'Expert Measurement and Mechanical Combination', *Organizational Behavior and Human Performance* (February 1972), pp. 86–106.

Firth, M., 'Consensus Views and Judgment Models in Materiality Decisions', *Accounting, Organizations and Society* (1979, No. 4), pp. 283–295.

Firth, M., 'Perceptions of Auditor Independence and Official Ethical Guidelines', *Accounting Review* (July 1980), pp. 451–466.

Gaumnitz, B. R., T. R. Nunamaker, J. J. Surdick, and M. F. Thomas, 'Auditor Consensus in Internal Control Evaluation and Audit Program Planning', *Journal of Accounting Research* (Autumn 1982), pp. 745–755.

Hamilton, R. E. and W. F. Wright, 'Internal Control Judgments and Effects of Experience: Replications and Extensions', *Journal of Accounting Research* (Autumn 1982), pp. 756–776.

Hays, W. L., *Statistics for Psychologists* (New York: Holt, Rinehart, and Winston, 1963).

Jiambalvo, J. and W. Waller, 'Decomposition and Assessments of Audit Risk', *Auditing: A Journal of Practice and Theory* (Spring 1984), pp. 80–88.

Johnson, R. N., 'Inherent Risk in Inventory Audits—An Investigation of Financial Statement Errors and Related Client Characteristics', Unpublished working paper, University of Southampton (UK), (February 1983).

Joyce, E. J., 'Expert Judgment in Audit Program Planning', *Journal of Accounting Research* (Supplement 1976), pp. 29–60.

Joyce, E. J. and R. Libby, 'Behavioral Research in Audit Decision Making', *Journal of Accounting Literature* (Spring 1982), pp. 103–123.

Kaplan, S. E. and P. J. Reckers, 'An Empirical Examination of Auditors' Initial Planning Processes', *Auditing: A Journal of Practice and Theory* (Fall 1984), pp. 1–19.

Krogstad, J. L., R. T. Ettenson, and J. Shanteau, 'Context and Experience in Auditors' Materiality Judgments', *Auditing: A Journal of Practice and Theory* (Fall 1984), pp. 54–73.

Leslie, D. A., 'An Analysis of the Audit Framework Focusing on Inherent Risk and the Role of Statistical Sampling in Compliance Testing', 1984 Touche Ross University of Kansas Symposium on Auditing Problems, pp. 89–125.

Libby, R. and B. L. Lewis, 'Human Information Processing Research in Accounting: The State of the Art', *Accounting, Organizations and Society* (1977, No. 3), pp. 245–268.

Libby, R. and B. L. Lewis, 'Human Information Processing Research in Accounting: The State of the Art in 1982', *Accounting, Organizations and Society* (1982, No. 3), pp. 231–285.

Lyness, K. and R. Cornelius, 'A Comparison of Holistic and Decomposed Judgment Strategies in a Performance Rating Simulation', *Organizational Behavior and Human Performance* (February 1982), pp. 21–38.

Mock, T. and J. L. Turner, Auditing Research Monograph No. 3: *Internal Accounting Control Evaluation and Auditor Judgment* (New York: AICPA, 1981).

Mock, T. and J. J. Willingham, 'An Improved Method of Documenting and Evaluating a System of internal Accounting Control', *Auditing: A Journal of Practice and Theory* (Spring 1983), pp. 91–99.

Raiffa, H., *Decision Analysis*, (Reading, Mass: Addison-Wesley, 1968).

Reckers, P. M. J. and M. E. Taylor, 'Consistency in Auditors' Evaluations of Internal Accounting Controls', *Journal of Accounting, Auditing, and Finance* (Fall 1979), pp. 42–55.

Schultz, J. J. and S. G. Gustavson, 'Actuaries' Perceptions of Variables Affecting the Independent Auditor's Legal Liability', *Accounting Review* (July 1978), pp. 626–641.

Shockley, R. A., 'Perceptions of Auditors' Independence: An Empirical Analysis', *Accounting Review* (October 1981), pp. 785–800.

Slovic, P., B. Fischhoff, and S. Lichtenstein, 'Behavioral Decision Theory', *Annual Review of Psychology* (1977), pp. 1–39.

Slovic, P., D. Fleissner, and W. S. Bauman, 'Analyzing the Use of Information in Investment Decision Making: A Methodological Proposal', *Journal of Business* (April 1972), pp. 283–301.

Snedecor, G. W. and W. G. Cochran, *Statistical Methods* (Ames, Iowa: The Iowa State University Press, 1980).

Snowball, D., 'On the Integration of Accounting Research on Human Information Processing', *Accounting and Business Research* (Summer 1980), pp. 307–318.

Srinidhi, B. N. and M. A. Vasarhelyi, 'Auditor Judgment Concerning Establishment of Substantive Tests Based on Internal Control Reliability', *Auditing: A Journal of Practice and Theory* (Spring 1986), pp. 64–76.

Willingham, J. J. and W. F. Wright, 'Estimation and Prediction of Errors in Financial Statements', *Auditing Research Symposium IV* (Champaign–Urbana, IL: University of Illinois), 1984.

Wright, W. F., 'Properties of Judgment Models in a Financial Setting', *Organizational Behavior and Human Performance* (February 1979), pp. 73–85.

JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents

Volume 13, Number 3
September 1990

Editorial Data

Douglas J. Skinner
Options Markets and the Information Content of Accounting Earnings Releases

Daniel W. Collins and Linda DeAngelo
Accounting Information and Corporate Governance: Market and Analyst Reactions to Earnings of Firms Engaged in Proxy Contests

Shehzad L. Mian and Clifford W. Smith, Jr.
Incentives Associated with Changes in Consolidated Reporting Requirements

John S. Strong
Valuation Effects of Holding Gains on Long Term Debt

Brett Trueman
Theories of Earnings/Announcement Timing

Advertisements

Forthcoming Conference

The annual conference of the Accounting Association of Australia and New Zealand (AAANZ) will be held at the Queensland University of Technology, Brisbane, 7–10 July 1991. Further information can be obtained from:

Colleen Jamieson (Chairperson AAANZ Conference Organising Committee)
School of Accountancy
Queensland University of Technology
GPO Box 2434
Brisbane QLD 4001
Australia

Accounting and Business Research, Vol. 21, No. 81, pp. 77–85, 1990

An Induced Theory of Financial Ratios

Mark Tippett*

Abstract—In recent years, a considerable volume of research has emerged on the analytical, empirical and statistical properties of financial ratios. In the present paper the methods of continuous time stochastic calculus are applied to the modelling of financial ratios. Two standard stochastic processes are examined and applied, namely the geometric Brownian motion and the elastic random walk. The properties of aggregate or 'industry ratios' and the reasonableness or otherwise of the 'proportionality assumption' are also examined. Typically, the approach of this paper implies that accounting ratios will be non-linear functions of time and normality will be the exception rather than the rule.

Introduction

In recent years, a considerable volume of research has emerged on the analytical, empirical and statistical properties of financial ratios. The seminal work and procedures were laid down by Lev (1969), Deakin (1976), Bird and McHugh (1977), Lev and Sunder (1979) and Whittington (1980). The subsequent work of Bougen and Drury (1980), Barnes (1982), Frecka and Hopwood (1983), McDonald and Morris (1984, 1985), Lee (1985), McLeay (1986), McLeay and Fieldsend (1987), Fieldsend, Longford and McLeay (1987), So (1987), Ezzamel, Mar-Molinero and Beecher (1987), Lee and Wu (1988), Kolari, McInish and Saniga (1989), Ezzamel and Mar-Molinero (1990) and others, has refined and extended the work of these 'early' authors.[1] Despite these efforts, little progress has been made in providing a satisfactory theory of financial ratios. The present paper explores the contribution that continuous time stochastic calculus models can make to this area.[2] Whilst some authors have hinted at the possibility of this approach (Lev and Sunder, 1979, pp. 204–205; McLeay, 1986), no one seems to have pursued the idea in any depth.

Unfortunately, space restrictions dictate that we examine the properties of ratios generated by two standard stochastic processes only. Hence we begin by assuming that the financial aggregates from which the ratio is constructed are generated by a 'geometric' Brownian motion. This assumption implies that the ratio itself will be both lognormally distributed and a non-linear function of time. We then turn to the Lev (1969) 'partial adjustment' model. It is shown that this second model assumes that the ratio's underlying financial aggregates are generated by an elastic random walk. The elastic random walk assumption implies that the ratio will be lognormally distributed and a non-linear function of time. Using the properties of ratios generated by these two standard processes, we then examine the reasonableness or otherwise of the 'proportionality assumption' (Lev and Sunder, 1979, pp. 190–194; Whittington, 1980, pp. 219–222). The proportionality assumption underpins much of the empirical and analytical work which has been conducted in the financial ratios area. Based on our analysis, however, it would seem that there are relatively few occasions on which the proportionality assumption can be justified.

The final two sections of the paper are devoted to analysing the properties of aggregate or 'industry ratios' and the role of equity ratios. For the two standard processes examined in the paper, the geometric mean of the individual firm ratios appears to represent as good a way as any of determining an industry average. Equity ratios, on the other hand, are the outcome of calculations over a discrete time period. The analytical inconvenience caused by this means that we can never be sure of the distributional properties of such ratios. Indeed, based on the analysis of this section, it appears unlikely that equity ratios will be normally distributed. However there are standard procedures which may be applied to determine the approximate probability density of a given equity ratio and these procedures are examined in some detail.

Geometric Brownian motion

We begin by assuming that we have two financial aggregates, neither of which can take on negative values. Examples might be current assets, 'quick' assets, current liabilities and fixed assets. We denote these financial aggregates by the symbols x_1

---

*Mark Tippett is a professor in the Department of Commerce, Australian National University. He acknowledges the very helpful comments of an anonymous referee and Professor Geoffrey Whittington of Cambridge University. The manuscript has been improved by their suggestions. Nevertheless, the author accepts responsibility for all remaining errors.

[1] Barnes (1987) provides an excellent short summary of much of this literature.

[2] See Okunev and Tippett (1990) for a simple introduction to continuous time stochastic calculus.

and x_2. To fix ideas, we suppose that both x_1 and x_2 evolve as 'geometric' Brownian motions. Hence, for x_1, we have (Cox and Miller, 1965, pp. 205–208; Smith, 1976, p. 15):[3]

$$\frac{\mathrm{d}x_1}{x_1} = \mu\ \mathrm{d}t + \mathrm{d}Z(t) \qquad (1)$$

where $\mu\ \mathrm{d}t$ is the instantaneous mean rate of growth in x_1 and $\mathrm{d}Z(t)$ is a 'white noise' process with variance parameter σ^2. A process is said to constitute 'white noise' if, over the successive time intervals $[t, t+\mathrm{d}t]$, it is an independently and identically distributed normal variate with mean zero and instantaneous variance given by $\sigma^2\,\mathrm{d}t$ (Hoel, Port and Stone, 1972, p. 141). Occasionally, $\mathrm{d}Z(t)$ is given the alternative representation $\mathrm{d}Z(t) = \sigma z\sqrt{\mathrm{d}t}$, where z is distributed as a standard normal variate and, as such, has mean zero and unit variance (Kannan, 1979, p. 271).[4] Similarly, for x_2, we have:

$$\frac{\mathrm{d}x_2}{x_2} = \theta\ \mathrm{d}t + \mathrm{d}Q(t) \qquad (2)$$

where $\theta\ \mathrm{d}t$ is the instantaneous mean rate of growth in x_2 and $\mathrm{d}Q(t)$ is a 'white noise' process with variance parameter δ^2. Again $\mathrm{d}Q(t)$ is occasionally given the alternative representation $\mathrm{d}Q(t) = \delta q\sqrt{\mathrm{d}t}$, where q is distributed as a standard normal variate. As shown in the Appendix, applying Ito's lemma (Arnold, 1973, pp. 88–92) to the ratio:[5]

$$r = \frac{x_1}{x_2} \qquad (3)$$

implies that the evolution of r is governed by the stochastic differential equation:

$$\frac{\mathrm{d}r}{r} = [\mu - \theta - \rho\sigma\delta + \delta^2]\,\mathrm{d}t + \mathrm{d}Z(t) - \mathrm{d}Q(t) \quad (4)$$

where $[\mu - \theta - \rho\sigma\delta + \delta^2]\,\mathrm{d}t$ is the instantaneous mean rate of growth in r whilst $\mathrm{d}Z(t)$ and $\mathrm{d}Q(t)$ are the 'white noise' processes previously defined. Note that the instantaneous variance of the rate of growth in r is (Freund and Walpole, 1987, p. 166):

$$\begin{aligned}\mathrm{Var}[\mathrm{d}Z(t) - \mathrm{d}Q(t)] &= \mathrm{Var}[\mathrm{d}Z(t)] \\ &\quad + \mathrm{Var}[\mathrm{d}Q(t)] - 2\mathrm{Cov}[\mathrm{d}Z(t), \mathrm{d}Q(t)] \\ \mathrm{Var}[\mathrm{d}Z(t) - \mathrm{d}Q(t)] &= [\sigma^2 + \delta^2 - 2\rho\sigma\delta]\,\mathrm{d}t\end{aligned}$$

where Var[.] is the variance of the relevant random variable, Cov[.,.] is the covariance between the two random variables and ρ is the Pearson product moment correlation coefficient between $\mathrm{d}Z(t)$ and $\mathrm{d}Q(t)$ (Conover, 1971, p. 244). Using standard techniques, it can be shown that the solution to the above stochastic differential equation is (Oksendal, 1985, pp. 38–39):

$$\begin{aligned}r(t) = r(0)\exp[(\mu - \tfrac{1}{2}\sigma^2)\,t \\ -(\theta - \tfrac{1}{2}\delta^2)\,t + Z(t) - Q(t)] \quad (5)\end{aligned}$$

where $Z(t)$ is called a Weiner–Levy–Einstein process with zero mean and variance $\sigma^2 t$.[6] Similarly, $Q(t)$ is a Weiner–Levy–Einstein process with mean zero and variance $\delta^2 t$. This implies that $r(t)$ is lognormally distributed with mean (Aitchison and Brown, 1957, p. 8):[7]

$$E[r(t)] = r(0)\exp[(\mu - \theta + \delta^2 - \rho\sigma\delta)t]$$

where E is the expectations operator, taken at time zero. Figure 1 contains the plot of the ratio, simulated using equation (5). The assumed parameter values for the simulation were $\mu = 0.05$, $\theta = 0.04$, $\sigma = \delta = 0.0625$ and $\rho = 0.5$.

It is interesting to note that, even when $\mu = \theta$, we can still expect systematic drift in the ratio. Hence, if $\mu = \theta$, we can expect a positive or negative drift

---

[3] Defining $\Delta x_1(t) = x_1(t+\Delta t) - x_1(t)$, then the realised rate of growth in the financial aggregate over the short time interval $[t, t+\Delta t]$ will be $\Delta x_1(t)/x_1(t)$. If we think of μ as being the financial aggregate's expected rate of growth on an annualised basis, then $\mu(\Delta t)$ represents the expected rate of growth over the time interval $[t, t+\Delta t]$. Similarly, given that $Z(t)$ represents the total random variation in the financial aggregate's rate of growth up to and including time t, then $\Delta Z(t) = Z(t+\Delta t) - Z(t)$ represents the random component in the rate of growth over the time interval $[t, t+\Delta t]$. Letting $\Delta t \to 0$ gives the limiting argument contained in the text.

[4] Since $\mathrm{d}Z(t)$ is normally distributed with zero mean and variance $\sigma^2\,\mathrm{d}t$ it follows that the variate $z = [\mathrm{d}Z(t)/\sigma\sqrt{\mathrm{d}t}]$ is distributed with mean zero and unit variance; that is, as a standard normal variate. We then have $\mathrm{d}Z(t) = z\sigma\sqrt{\mathrm{d}t}$.

[5] The present paper makes extensive use of Ito's lemma, which is the stochastic calculus analogue of the 'total derivative' of ordinary (non-stochastic) calculus. To illustrate, the (non-stochastic) total derivative of equation (3) is given by Maxwell (1954, pp. 29–36):

$$\mathrm{d}r = \frac{\partial r}{\partial x_1}(\mathrm{d}x_1) + \frac{\partial r}{\partial x_2}(\mathrm{d}x_2)$$

Since:

$$\frac{\partial r}{\partial x_1} = \frac{1}{x_2} \quad \text{and} \quad \frac{\partial r}{\partial x_2} = -\frac{x_1}{x_2^2}$$

and using equation (3), it follows that:

$$\frac{dr}{r} = \frac{dx_1}{x_1} - \frac{dx_2}{x_2}$$

is the rate of growth in r in terms of the proportionate changes in x_1 and x_2. However as shown in the Appendix, in the Ito (stochastic) calculus two additional terms appear in the expression for $\mathrm{d}r/r$. These additional terms ensure the existence of an appropriate variance–covariance structure for the underlying ratio. See Okunev and Tippett (1990) and the Appendix for further details.

[6] Since $Z(t)$ is the sum of all the independent and identically distributed $\mathrm{d}Z(t)$ obtained from equation (1), it follows that

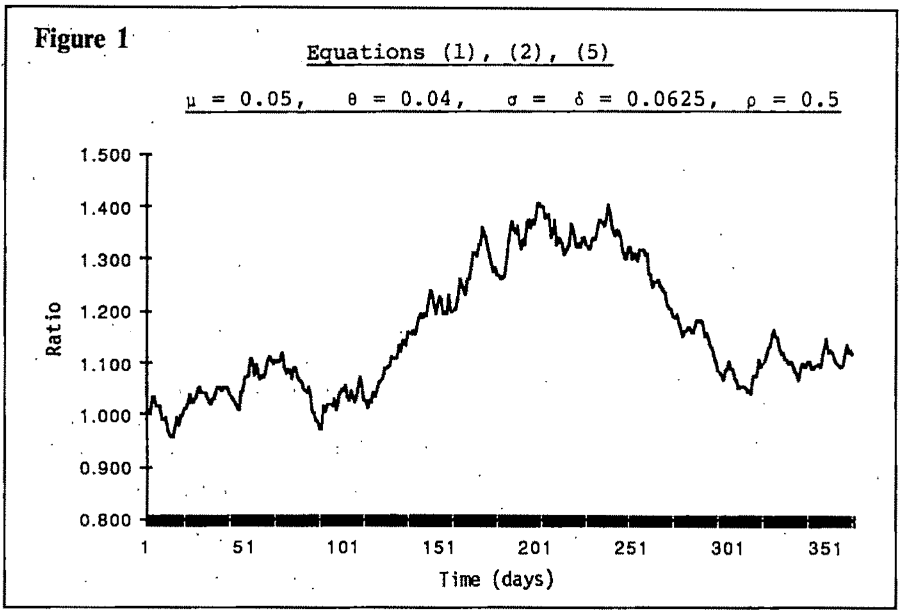
$$E[Z(t)] = E\left[\sum \mathrm{d}Z(t)\right] = 0.$$

Further,

$$\mathrm{Var}[Z(t)] = \mathrm{Var}\left[\sum \mathrm{d}Z(t)\right] = \sum \mathrm{Var}[\mathrm{d}Z(t)] = \sigma^2\,\Sigma\,\mathrm{d}t = \sigma^2 t.$$

[7] Deakin (1976), McLeay (1986), Ezzamel, Mar-Molinero and Beecher (1987), Kolari, McInish and Saniga (1989) and Ezzamel and Mar-Molinero (1990) all report results which are consistent with certain ratios being lognormally distributed.

Figure 1



in the ratio, according to whether $(\delta/\rho\sigma)$ exceeds or is less than unity.

An important characteristic of equation (5) is that the ratio is a non-linear function of time. As we note at a later point, much of the extant research on ratio analysis adopts the strong assumption that there is strict proportionality between the underlying financial aggregates from which the ratio is constructed (Lev and Sunder, 1979, p. 192; Whittington, 1980, pp. 219–222). However, as can be seen from equation (5), if the financial aggregates evolve as geometric Brownian motions, the proportionality assumption cannot be justified.

Elastic random walk

In a seminal paper, Lev (1969) argued that financial ratios follow a partial adjustment model. The distinguishing characteristic of this model is explained by Lev (1969, p. 292) in the following terms:

> when the firm observes a deviation between its ratio and the industry mean . . . it will adjust its ratio in the next period . . . . so that the observed deviation will be partially eliminated.

To illustrate the type of stochastic process which is consistent with this model, suppose our two previously considered financial aggregates evolve in accordance with the following stochastic differential equations:

$$\frac{\mathrm{d}x_1}{x_2} = -\lambda \log \frac{x_1}{g(t)} \mathrm{d}t + \mathrm{d}Z(t) \qquad (6)$$

and:

$$\frac{\mathrm{d}x_2}{x_2} = -\lambda \log \frac{x_2}{h(t)} \mathrm{d}t + \mathrm{d}Q(t) \qquad (7)$$

As previously, $\mathrm{d}Z(t)$ and $\mathrm{d}Q(t)$ are 'white noise' processes with variance parameters σ^2 and δ^2 respectively. These processes are elastic random walks (Kac, 1947, pp. 369–385) in the sense that both x_1 and x_2 have a greater tendency to revert to their 'normal' values of $g(t)$ and $h(t)$, respectively, the further they are removed from them. In this respect $\lambda > 0$ is a parameter which measures the intensity with which the financial aggregates are drawn back to their normal values. Hence should $x_1 > g(t)$, then $\log[x_1/g(t)]$ will be positive and the instantaneous expected rate of growth in x_1 will be negative. Similarly, when $x_1 < g(t)$, the instantaneous expected rate of growth in x_1 will be positive. Using equation (3) and Ito's lemma, it follows that the evolution of the ratio of the two financial aggregates is governed by the following stochastic differential equation:

$$\frac{\mathrm{d}r}{r} = \left[(\delta^2 - \rho\sigma\delta) - \lambda \log \frac{r}{\mu}\right] \mathrm{d}t + dZ(t) - \mathrm{d}Q(t) \qquad (8)$$

where $\mu = g(t)/h(t)$, a constant, is the 'normal' value to which the ratio reverts and ρ is the Pearson product moment correlation coefficient between $\mathrm{d}Z(t)$ and $\mathrm{d}Q(t)$. Analysis similar to that employed in the previous section shows that the instantaneous mean rate of growth in the ratio amounts to:

$$[(\delta^2 - \rho\sigma\delta) - \lambda \log(r/\mu)]\,\mathrm{d}t$$

whilst the instantaneous variance is:

$$[\sigma^2 + \delta^2 - 2\rho\sigma\delta]\,\mathrm{d}t$$

Using standard techniques, it may be shown that the solution to this stochastic differential equation is:

$$r(t) = \mu \exp\left[\gamma - \frac{(\sigma^2 - \delta^2)}{2\lambda}\right] \qquad (9)$$

where:

$$\gamma(t) = \mathrm{e}^{-\lambda t} \int_0^t \mathrm{e}^{\lambda s}\,\mathrm{d}V(s) \tag{10}$$

is an additive elastic random walk with:

$$\mathrm{d}V(s) = \mathrm{d}Z(s) - \mathrm{d}Q(s)$$

(Doob, 1942, pp. 358–366). Figure 2 contains a plot of the ratio, simulated using equation (9). The assumed parameter values for the simulation were $\lambda = 1$, $\mu = 1$, $\sigma = \delta = 0.0625$ and $\rho = 0.5$.

Equation (9) implies that $r(t)$ is lognormally distributed (Aitchison and Brown, 1957, p. 8). Further, it may also be shown that the above model implies that there will be systematic drift in the ratio with time. Finally, note that as with the geometric Brownian motion based model considered in the previous section, the proportionality assumption implicit in much of ratio analysis is also violated in this instance.

The proportionality assumption

An implicit assumption behind much of ratio analysis is that of proportionality in the underlying variables or, as Whittington (1980, p. 219) has put it:

> The basic assumption of ratio analysis is that of *proportionality*, i.e. it is expected that a proportionate relationship exists, or ought to exist, between the two variables whose ratio is calculated.

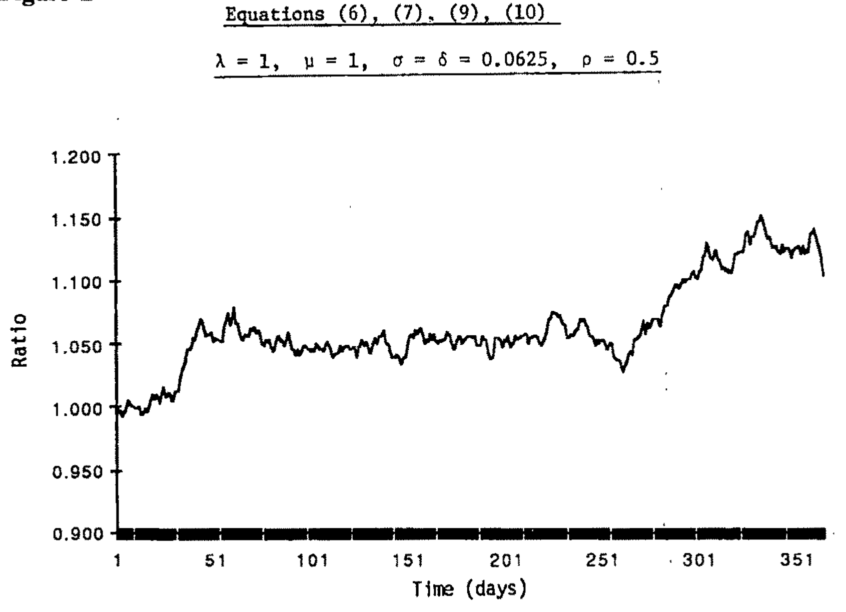
Traditionally this has meant that financial ratios are modelled in a time series context by the following stochastic process (McLeay and Fieldsend, 1987, p. 133; Ezzamel, Mar-Molinero and Beecher, 1987, p. 467):

$$r(t) = \beta_1 + \epsilon_1(t) \tag{11}$$

where β_1 is the expected value of the ratio at time t, and $\epsilon_1(t)$ is a random variable, usually assumed to be normally distributed with zero mean. This issue has been investigated in a variety of contexts by Barnes (1982, 1986), McDonald and Morris (1984, 1985) and McLeay and Fieldsend (1987) amongst others. On purely *a priori* grounds, however, it is impossible for many ratios to assume this form. Note that if $\epsilon_1(t)$ is large enough, then the ratio may assume negative values. Hence in the absence of convincing argument to the contrary, the model is precluded for ratios which cannot assume negative values. Obvious examples are the current ratio, the 'quick' assets ratio and fixed asset ratios.

To illustrate the dangers of mistakenly imposing this assumption, suppose equations (1) and (2) provide valid descriptions of the stochastic processes generating the underlying financial aggregates. Equation (5) then describes the process generating the ratio of the financial aggregates. Comparing equations (5) and (11), it is clear that equation (11) represents a serious mis-specification of the 'true' situation and little credibility could be attached to analyses based upon it. But this begs the question as to what is the appropriate form for a time series regression when the underlying stochastic processes are described by equations (1) and (2). A useful starting point is to note that

Figure 2



equation (5) is a log-linear function of time, namely:

$$\log[r(t)] = \alpha_2 + \beta_2 t + \epsilon_2(t) \qquad (12)$$

where $\alpha_2 = \log[r(0)]$, $\beta_2 = [(\mu - \theta) - (\sigma^2 - \delta^2)/2]$ and $\epsilon_2(t) = Z(t) - Q(t)$. Hence, at first glance, an ordinary least squares (OLS) regression using the logarithm of the ratio might appear to be justified. Such a procedure will in fact provide unbiased estimates of the parameters α_2 and β_2 (Johnston, 1972, p. 210). However the error term, $\epsilon_2(t)$, has mean zero and variance $[\sigma^2 + \delta^2 - 2\rho\sigma\delta]t$ which means, of course, that it is heteroscedastic (Johnston, 1972, pp. 214–221). Because of this, no meaning can be attached to the Student's t statistics generated by the OLS procedures (Johnston, 1972, p. 210). One way of overcoming the heteroscedasticity problem, however, is to scale the log ratio by $\sqrt{t}$, running a regression of the form:

$$\frac{\log[r(t)]}{\sqrt{t}} = \frac{\alpha_2}{\sqrt{t}} + \beta_2\sqrt{t} + \frac{\epsilon_2(t)}{\sqrt{t}} \qquad (13)$$

For this model, we have:

$$\mathrm{Var}\left[\frac{\epsilon_2(t)}{\sqrt{t}}\right] = \sigma^2 + \delta^2 - 2\rho\sigma\delta \qquad (14)$$

where, as previously, Var[.] is the variance of the relevant random variable. It follows that the error term is homoscedastic, but the regression is no longer bivariate and must be run in such a way as to suppress the constant term produced by most statistical packages. Under these circumstances an OLS regression provides unbiased and efficient estimates of the parameters α_2 and β_2 (Johnston, 1972, p. 23).[8]

Similar difficulties arise if the evolution of the financial aggregates is governed by the elastic random walk formalised through equations (6) and (7). In this instance equations (9) and (10) describe the process generating the relevant ratio. Obviously a regression of the form given by equation (11) represents a serious mis-specification, and little credibility could be attached to analyses based upon it.

To determine the appropriate form of the regression, suppose we take the logarithm of the first difference in equation (9) over the time interval $[t, t + \Delta t]$, in which case we have:

$$\log\left[\frac{r(t+\Delta t)}{r(t)}\right] = \Delta\gamma(t) \qquad (15)$$

where $\Delta\gamma(t) = \gamma(t + \Delta t) - \gamma(t)$, for $\gamma(t)$ given by equation (10). Using equation (10), it then follows:

$$\log\left[\frac{r(t+\Delta t)}{r(t)}\right] = (e^{-\lambda\Delta t} - 1)\gamma(t) + e^{-\lambda(t+\Delta t)}\int_t^{t+\Delta t} e^{\lambda s}\,dV(s) \qquad (16)$$

Finally, taking logarithms across equation (9) and substituting the expression for $\gamma(t)$, we have:

$$\begin{aligned}\log\left[\frac{r(t+\Delta t)}{r(t)}\right] &= (e^{-\lambda\Delta t} - 1)\left[\frac{\sigma^2 - \delta^2}{2\lambda} - \log\mu\right] \\ &\quad + (e^{-\lambda\Delta t} - 1)\log[r(t)] \\ &\quad + e^{-\lambda(t+\Delta t)}\int_t^{t+\Delta t} e^{\lambda s}\,dV(s) \qquad (17)\end{aligned}$$

The above equation has the form of the following regression model:

$$\log\left[\frac{r(t+\Delta t)}{r(t)}\right] = \alpha_3 + \beta_3\log[r(t)] + \epsilon_3(t) \qquad (18)$$

where

$$\beta_3 = (e^{-\lambda\Delta t} - 1)$$

$$\alpha_3 = \beta_3\left(\frac{\sigma^2 - \delta^2}{2\lambda} - \log\mu\right)$$

and

$$\epsilon_3(t) = e^{-\lambda(t+\Delta t)}\int_t^{t+\Delta t} e^{\lambda s}\,dV(s)$$

Since it may be shown that $\epsilon_3(t)$ is serially uncorrelated with the homoscedastic variance (Doob, 1942, p. 359):

$$\mathrm{Var}[\epsilon_3(t)] = \frac{(\sigma^2 + \delta^2 - 2\rho\sigma\delta)}{2\lambda}(1 - e^{-2\lambda\Delta t}) \qquad (19)$$

it follows that the standard regression assumptions are satisfied. Hence, an OLS regression of the form given by equation (18) will produce unbiased and efficient estimates of the parameters α_3 and β_3. These will in turn provide unbiased and efficient estimates of the parameters μ, σ^2, δ^2 and λ (Johnston, 1972, p. 23).

The principal import of both the above and prior example is that they show that the appropriate form for a time series regression hinges critically on the form of the stochastic process governing the evolution of the financial ratio. The simple expedient of assuming a time series regression of the form given by equation (11) is almost certain to result in serious mis-specification errors.

Industry average ratio

Given that individual firm ratios are generated by the above stochastic processes, the question arises as to the appropriate method of aggregation into an industry average (Lev and Sunder, 1979, pp. 202–208). To illustrate the procedures involved, suppose the underlying financial aggregates are generated by equations (1) and (2). This in turn implies that the ratio itself is described by equation (5). Suppose an industry ratio is computed by taking the geometric mean of the individual firm ratios (Lev and Sunder, 1979, pp. 204–205; Fieldsend, Longford and McLeay, 1987, p. 513). We then have:

---

[8] Breusch and Pagan (1979) have outlined a test for heteroscedasticity when it is suspected that the regression is of the form given by equation (12). The test involves using the estimated residuals from an OLS regression based on (12). A 'second pass' OLS regression is then conducted on the *squared* residuals against time. If the OLS 'time' coefficient is significant using the usual parametric test, then the null hypothesis of an homoscedastic error term is rejected. The test is in fact a more rigorous application of the earlier work of P. A. Gorringe, cited in Johnston (1972, p. 219).

$$r_I(t) = \left[\prod_{j=1}^{N} r_j(t)\right]^{1/N} \tag{20}$$

where $r_I(t)$ is the industry 'average' and the $r_j(t)$, $j = 1, 2, \ldots, N$ are the individual firm ratios. Substituting equation (5), it follows that:

$$r_I(t) = \left\{\exp\left[\sum_{j=1}^{N} \{(\mu_j - \tfrac{1}{2}\sigma_j^2)t - (\theta_j - \tfrac{1}{2}\delta_j^2)t + Z_j(t) - Q_j(t)\}\right] \prod_{j=1}^{N} r_j(0)\right\}^{1/N} \tag{21}$$

where the j subscripts refer to the individual firm values, is the expression for the industry 'average'. Taking logarithms across the above expression, we have:

$$\log[r_I(t)] = \frac{\sum_{j=1}^{N} \{\log[r_j(0)] + (\mu_j - \tfrac{1}{2}\sigma_j^2)t - (\theta_j - \tfrac{1}{2}\delta_j^2)\,t + Z_j(t) - Q_j(t)\}}{N} \tag{22}$$

Since the $Z(t)$ and $Q(t)$ are normally distributed with zero means (Hoel, Port and Stone, 1972, pp. 122–124), the distribution of the logarithm of the industry average is normal with mean:

$$E\{\log[r_I(t)]\} = \frac{\sum_{j=1}^{N} \{\log[r_j(0)] + (\mu_j - \tfrac{1}{2}\sigma_j^2)\,t - (\theta_j - \tfrac{1}{2}\delta_j^2)\,t\}}{N} \tag{23}$$

and a variance which depends on the covariance structure of the firm ratios from which the industry average is constructed. Assuming all firms are 'small' in relation to the industry, then specifying a value for t permits standard parametric tests to be conducted for departure of firm ratios from the industry 'average'.

A similar analysis may be applied to the case where the financial aggregates are generated by the elastic random walk formalised through equations (6) and (7). Such an assumption implies that the ratio itself is described by equation (9). Substituting equation (9) into equation (20), it follows that the industry average is given by:

$$r_I(t) = \left\{\exp\left[\sum_{j=1}^{N}\left(\gamma_j - \frac{\sigma_j^2 - \delta_j^2}{2\lambda_j}\right)\right]\prod_{j=1}^{N}\mu_j\right\}^{1/N} \tag{24}$$

where, as previously, the j subscripts represent the individual firm ratios. Taking the logarithm across the above expression, we have:

$$\log[r_I(t)] = \frac{\sum_{j=1}^{N}\left(\log\mu_j + \gamma_j - \frac{\sigma_j^2 - \delta_j^2}{2\lambda_j}\right)}{N} \tag{25}$$

Since $\gamma(t)$ is normally distributed with zero mean (Doob, 1942, pp. 358–366), the distribution of the logarithm of the industry average is normal with mean:

$$E\{\log[r_I(t)]\} = \frac{\sum_{j=1}^{N}\left(\log\mu_j - \frac{\sigma_j^2 - \delta_j^2}{2\lambda_j}\right)}{N} \tag{26}$$

and a variance which depends on the covariance structure of the firm ratios from which the industry average is constructed.

However we need to be careful with the above analysis, for as Lev and Sunder (1979, pp. 204–205) note:

> When the cross-sectional distribution of the ratio under examination is lognormal, there is room for disagreement about the appropriate summary measure or standard for the industry, since the arithmetic mean of the lognormal distribution is larger than the median, which in turn is larger than the modal value.... It is interesting to note that the median of the industry ratio distribution is often used as a standard for ratio evaluation such as in Dun and Bradstreet's *Key Business Ratios*. The reasons given for this choice of the median are generally related to its robustness to large outliers and measurement errors.

Unfortunately, except for some standard cases which do not apply to the above analysis, the distribution of the median is not known (Freeman, 1963, pp. 195–196). This places severe limits on the relevance of the median as an industry norm.

Equity ratios

Several authors have examined the properties of profitability or equity ratios. Details are to be found in the works of Barnes (1982), McDonald and Morris (1984, 1985) and McLeay and Fieldsend (1987) amongst others. To fix ideas, suppose that a firm's assets and liabilities are generated in accordance with the geometric Brownian motions described by equations (1) and (2). Using the fundamental balance sheet identity we then have:

$$\Delta D(t) = \Delta A(t) - \Delta L(t)$$

where $\Delta D(t)$ is the change in shareholders' equity $[D(t)]$ over the finite time interval $[t, t+\Delta t]$, $\Delta A(t)$ is the change in the firm's assets $[A(t)]$ and $\Delta L(t)$ is the change in the firm's liabilities $[L(t)]$. Using this identity and equations (1) and (2), it may be shown that the change in shareholders' equity over the interval $[t, t+\Delta t]$ is given by:

$$\Delta D(t) = [\mu A - \theta L]\Delta t + [z\sigma A - q\delta L]\sqrt{\Delta t} + O[\Delta t] \quad (27)$$

where $O[\Delta t]$ means that we have left out terms which are multiples of Δt but that these terms converge to zero as $\Delta t \to 0$.[9] In the absence of capital contributions and withdrawals, $\Delta D(t)$ represents the firm's profit over the time interval $[t, t+\Delta t]$. Hence, it follows that:

$$\frac{\Delta D(t)}{D(t)} = \frac{[\mu A - \theta L]\Delta t + [z\sigma A - q\delta L]\sqrt{\Delta t} + O[\Delta t]}{D} \quad (28)$$

represents the return to shareholders' equity over the time period $[t, t+\Delta t]$. Taking expectations across the above expression, it may be shown that the mean return on shareholders' equity over the interval $[t, t+\Delta t]$ is given by (Patel and Read, 1982, pp. 22, 309):

$$E\left[\frac{\Delta D(t)}{D(t)}\right] = \frac{[\mu A - \theta L]\Delta t + O[(\Delta t)^2]}{D} \quad (29)$$

Similarly, it may be shown that the variance is given by (Patel and Read, 1982, pp. 22, 309):

$$\operatorname{Var}\left[\frac{\Delta D(t)}{D(t)}\right] = \frac{[\sigma^2 A^2 + \delta^2 L^2 - 2\rho\sigma\delta AL]\Delta t + O[(\Delta t)^2]}{D^2} \quad (30)$$

If Δt is small, we can ignore the higher order terms in equations (29) and (30) and the distribution of $\Delta D/D$ will be approximately normal. Note, however, that using a time series of actual observations for $\Delta D/D$ to estimate the mean and variance of the return to equity is fraught with danger. Unless the firm maintains a constant debt/equity ratio, attempts to estimate the parameters in this way will be garbled by time series variations in the firm's assets and liabilities. In other words, the mean and variance of the return to equity are best estimated from the mean-variance parameters applicable to the firm's underlying asset/liability aggregates.

It is also clear from the above analysis that there must always be considerable doubt as to whether the return to equity is normally distributed. Indeed, this position is supported by several cross-sectional empirical studies (Bird and McHugh, 1977; McDonald and Morris, 1985; Ezzamel, Mar-Molinero and Beecher, 1987; Kolari, McInish and Saniga, 1989; Ezzamel and Mar-Molinero, 1990). One way of overcoming this is to approximate the distribution of the return to equity as a Gram-Charlier series or an Edgeworth expansion. The two expansions are formally identical (Kendall and Stuart, 1958, pp. 155–160), but since the Gram-Charlier series is analytically the more convenient to deal with, we use it to illustrate the principles involved.

The basic idea behind the Gram-Charlier system is that a 'density function is represented by an infinite series consisting of a linear function of a *normal* density and its succesive derivatives' (Freeman, 1963, p. 156). Under certain plausible assumptions, such series converge asymptotically to the density function being approximated (Freeman, 1963, p. 159). Defining μ_j as the jth moment, then the probability density $f(x)$ of the *normalised* return on the shareholders' equity

$$x = \Delta D/D - E[\Delta D/D]$$

can be approximated by the following expression (Kendall and Stuart, 1958, pp. 155–157):

$$f(x) = \alpha(x)\{1 + \tfrac{1}{2}(\mu_2 - 1)H_2 + \tfrac{1}{6}\mu_3 H_3 + \tfrac{1}{24}(\mu_4 - 6\mu_2 + 3)H_4 + \cdots\} \quad (31)$$

where

$$\alpha(x) = \frac{1}{\sqrt{2\pi}}\exp[-\tfrac{1}{2}x^2] \quad (32)$$

is the standard normal density function and the H_j are called Hermite polynomials. The first few Hermite polynomials are (Kendall and Stuart, 1958, p. 155):

$$H_0(x) = 1$$

$$H_1(x) = x$$

$$H_2(x) = x^2 - 1$$

$$H_3(x) = x^3 - 3x$$

$$H_4(x) = x^4 - 6x^2 + 3 \quad (33)$$

---

[9] Of necessity the explanation of the 'big O' notation contained in the text is somewhat vague and heuristic. However, if there is a constant K such that $|f| \leqslant K\phi$ then we write $f = O(\phi)$. A more rigorous explanation is to be found in Flett (1966, p. 124) or Hardy (1943, pp. 164–166, 183–184). These references also contain clear explanations of the differences between 'little o' and 'big O' notation, which are often confused in the literature.

whilst a general recursion formula is (Kendall and Stuart, 1958, p. 156):

$$H_n(x) = xH_{n-1}(x) - (n-1)H_{n-2}(x) \quad (34)$$

Previously we have shown that μ_2 can be approximated by equation (30). Using similar procedures, it may be shown that (Patel and Read, 1982, pp. 22, 309):

$$\mu_3 = \frac{O[(\Delta t)^2]}{D^3} \quad (35)$$

and

$$\mu_4 = \frac{[3(\sigma^4A^4 + \delta^4L^4) - 12\rho\sigma\delta AL(\sigma^2A^2 + \delta^2L^2) + 6(1 + 2\rho^2)\sigma^2\delta^2A^2L^2](\Delta t)^2 + [O(\Delta t)^3]}{D^4} \quad (36)$$

Accurate estimates of the moments (μ_j) are critical if the above procedures are to be effective. Previous analysis has shown that approximations to the moments can be had to any desired level of accuracy. Hence, whilst μ_2 can be approximated by equation (30), this ignores terms of $O[(\Delta t)^2]$, and the resultant approximation may be far from satisfactory. By including higher order terms, better approximations will be obtained. Suffice it to say that, when the above procedures are used to approximate the probability density, they may then be used to estimate the probabilities of events of interest, such as whether the current period's return is significantly different from any other period's return.

Levy distributions

In general the above analysis assumes that changes, proportionate or otherwise, in the 'size' of the financial aggregates from which the ratio is constructed can be decomposed into a deterministic drift term and a 'white noise' (or independent and identically distributed normal) component. Whilst this assumption provides a certain amount of analytical convenience and tractability, it needs to be emphasised that much of the above analysis could have been conducted in terms of distributions whose continuous time transition probabilities are any of the stable density functions classified by Levy (1954, pp. 198–211). The properties of these distributions are briefly summarised by Doob (1942, pp. 367–368). So (1987) provides some empirical evidence on the suitability of these distributions for modelling British financial ratios. Suffice it to say, however, that for such distributions the variance will almost certainly never exist and the mean may not exist. Doob (1942, p. 368) shows that these processes possess a 'characteristic function' of the form $\exp[-(\sigma_0)^2|z|\gamma]$, where z is a scalar and σ_0^2 plays the 'role' of a variance. For the normal distribution $\gamma = 2$ and this is the only Levy distribution for which the variance exists. Generalising the above analysis to take account of these distributions would represent a significant contribution to the literature in this area.

Summary and conclusions

The present paper outlines the potential contribution which continuous time stochastic calculus could make to the theory of financial ratios. This approach is in marked contrast to most of the existing literature in the area since its primary emphasis is on the financial aggregates from which the ratio is composed, and not the ratio itself. Specifically, by assuming that the underlying financial aggregates are generated by diffusion processes, the ratio is taken to be an induced measure whose properties can be derived by applying standard results from continuous time stochastic calculus. Two standard processes were examined in some detail and, in conjunction with Ito's lemma, were used to derive the distributional and time series properties of financial ratios. Typically, this approach implies that accounting ratios will be non-linear functions of time. Further, normality will be the exception rather than the rule.

There are several areas where the above analysis could be extended. Firstly, in most of the areas examined by the paper the implications of the continuous time stochastic calculus approach have not been fully worked out. For example, what is the appropriate aggregation metric for industry equity ratios? There seems to be no obvious answer. Secondly, the relevance of other 'non-standard' stochastic processes to ratio analysis could be examined. Thirdly and most importantly, the empirical plausibility of the approach needs to be tested. An obvious starting point is to see whether equations (13) and (18) provide a 'better' fit to actual time series data than their more traditionally used counterpart, equation (11). However, because of the length of the present paper, we leave these and other issues in the capable hands of future researchers.

References

Aitchison, J. and J. Brown, *The Lognormal Distribution*, Cambridge: Cambridge University Press, 1957.

Arnold, L., *Stochastic Differential Equations*, New York: Wiley, 1973.

Barnes, P., 'Methodological Implications of Non-normally Distributed Financial Ratios', *Journal of Business Finance and Accounting*, Summer 1982, pp. 51–62.

Barnes, P., 'The Statistical Validity of the Ratio Method in Financial Analysis: An Empirical Examination: A Comment', *Journal of Business Finance and Accounting*, Winter 1986, pp. 627–632.

Barnes, P., 'The Analysis and Use of Financial Ratios: A Review', *Journal of Business Finance and Accounting*, Winter 1987, pp. 449–461.

Bird, R. and A. McHugh., 'Financial Ratios—An Empirical Study', *Journal of Business Finance and Accounting*, Spring 1977, pp. 29–46.

Bougen, P. and J. Drury., 'U.K. Statistical Distributions of Financial Ratios', *Journal of Business Finance and Accounting*, Spring 1980, pp. 39–47.

Breusch, T. and A. Pagan, 'A Simple Test for Heteroscedasticity and Random Coefficient Variation', *Econometrica*, September 1979, pp. 1287–1294.

Conover, W., *Practical Nonparametric Statistics*, New York: Wiley, 1971.

Cox, D. and H. Miller, *The Theory of Stochastic Processes*, London: Chapman and Hall, 1965.

Deakin, E., 'Distributions of Financial Accounting Ratios: Some Empirical Accounting Evidence', *Accounting Review*, January 1976, pp. 90–96.

Doob, J., 'The Brownian Movement and Stochastic Equations', *Annals of Mathematics*, April 1942, pp. 351–369.

Ezzamel, M., C. Mar-Molinero and A. Beecher, 'On the Distributional Properties of Financial Ratios', *Journal of Business Finance and Accounting*, Winter 1987, pp. 463–481.

Ezzamel, M. and C. Mar-Molinero, 'The Distributional Properties of Financial Ratios in UK Manufacturing Companies', *Journal of Business Finance and Accounting*, Spring 1990, pp. 1–29.

Fieldsend, S., N. Longford and S. McLeay, 'Ratio Analysis: A Variance Component Analysis', *Journal of Business Finance and Accounting*, Winter 1987, pp. 497–517.

Flett, T., *Mathematical Analysis*, London: McGraw-Hill, 1966.

Freeman, H., *Introduction to Statistical Inference*, Reading, Massachusetts: Addison-Wesley, 1963.

Frecka, T. and W. Hopwood, 'The Effects of Outliers on the Cross Sectional Distributional Properties of Financial Ratios', *Accounting Review*, January 1983, pp. 115–128.

Freund, J. and R. Walpole, *Mathematical Statistics*, Englewood Cliffs, New Jersey: Prentice-Hall, 1987.

Hardy, G., *A Course of Pure Mathematics*, Cambridge: Cambridge University Press, 1943.

Hoel, P., S. Port and C. Stone, *Introduction to Stochastic Processes*, Boston: Houghton Mifflin, 1972.

Johnston, J., *Econometric Methods*, Sydney: McGraw-Hill, 1972.

Kac, M., 'Random Walk and the Theory of Brownian Motion', *American Mathematical Monthly*, April 1947, pp. 369–417.

Kannan, D., *An Introduction to Stochastic Processes*, New York: North Holland, 1979.

Kendall, M. and A. Stuart, *The Advanced Theory of Statistics*, Volume 1, London: Charles Griffin, 1958.

Kolari, J., T. McInish and E. Saniga, 'A Note on the Distribution Types of Financial Ratios in the Commercial Banking Industry', *Journal of Banking and Finance*, July 1989, pp. 463–471.

Lee, C. and C. Wu, 'Expectation Formation and Financial Ratio Adjustment Processes', *Accounting Review*, April 1988, pp. 292–306.

Lee, C-W., 'Stochastic Properties of Cross Sectional Financial Data', *Journal of Accounting Research*, Spring 1985, pp. 213–227.

Lev, B., 'Industry Averages as Targets for Financial Ratios', *Journal of Accounting Research*, Autumn 1969, pp. 290–299.

Lev, B. and S. Sunder, 'Methodological Issues in the Use of Financial Ratios', *Journal of Accounting and Economics*, January 1979, pp. 187–210.

Levy, P., *Théorie de l'Addition des Variables Aléatoires*, Paris: Gauthier-Villars, 1954.

McDonald, B. and M. Morris, 'The Statistical Validity of the Ratio Method in Financial Analysis: An Empirical Examination', *Journal of Business Finance and Accounting*, Spring 1984, pp. 89–97.

McDonald, B. and M. Morris, 'The Functional Specification of Financial Ratios: An Empirical Investigation', *Accounting and Business Research*, Summer 1985, pp. 223–228.

McLeay, S., 'Student's *t* and the Distribution of Financial Ratios', *Journal of Business Finance and Accounting*, Summer 1986, pp. 209–222.

McLeay, S., 'The Ratio of Means and the Mean of Ratios and Other Benchmarks: An Examination of Characteristic Financial Ratios in the French Corporate Sector', *Finance; The Journal of the French Finance Association* (1986), pp. 75–93.

McLeay, S. and S. Fieldsend, 'Sector and Size Effects in Ratio Analysis: An Indirect Test of Ratio Proportionality', *Accounting and Business Research*, Spring 1987, pp. 133–140.

Maxwell, E., *Analytic Calculus*, Volume III, Cambridge: Cambridge University Press, 1954.

Oksendal, B., *Stochastic Differential Equations*, Berlin: Springer-Verlag, 1985.

Okunev, J. and M. Tippett, 'Continuous Time Stochastic Calculus: A Survey of Applications in Finance and Accountancy', *IMA Journal of Mathematics Applied in Business and Industry*, 1990, forthcoming.

Patel, J. and C. Read, *Handbook of the Normal Distribution*, New York: Marcel Dekker, 1982.

Smith, C., 'Option Pricing: A Review', *Journal of Financial Economics*, January 1976, pp. 3–51.

So, J., 'Some Empirical Evidence on the Outliers and Nonnormal Distribution of Financial Ratios', *Journal of Business Finance and Accounting*, Winter 1987, pp. 483–496.

Whittington, G., 'Some Basic Properties of Accounting Ratios', *Journal of Business Finance and Accounting*, Summer 1980, pp. 219–232.

Mathematical appendix

In the context of the ratio equation (3), Ito's lemma implies (Arnold, 1973, pp. 88–92):

$$\mathrm{d}r = \frac{\partial r}{\partial x_1}(\mathrm{d}x_1) + \frac{\partial r}{\partial x_2}(\mathrm{d}x_2) + \frac{\partial r}{\partial t}(\mathrm{d}t) + \tfrac{1}{2}(\mathrm{d}x_1)^2\frac{\partial^2 r}{\partial x_1^2} + \tfrac{1}{2}(\mathrm{d}x_2)^2\frac{\partial^2 r}{\partial x_2^2} + (\mathrm{d}x_1\,\mathrm{d}x_2)\frac{\partial^2 r}{\partial x_1 x_2}$$

Since:

$$\frac{\partial r}{\partial x_1} = \frac{1}{x_2};\quad \frac{\partial r}{\partial x_2} = -\frac{x_1}{x_2^2};\quad \frac{\partial^2 r}{\partial x_1^2} = 0;$$

$$\frac{\partial^2 r}{\partial x_2^2} = \frac{2x_1}{x_2^3};\quad \frac{\partial^2 r}{\partial x_1 \partial x_2} = -\frac{1}{x_2^2}$$

then it follows:

$$\mathrm{d}r = \frac{\mathrm{d}x_1}{x_2} - \frac{x_1(\mathrm{d}x_2)}{x_2^2} + \frac{x_1(\mathrm{d}x_2)^2}{x_2^3} - \frac{(\mathrm{d}x_1\,\mathrm{d}x_2)}{x_2^2}$$

or upon using equation (3) of the text:

$$\frac{\mathrm{d}r}{r} = \frac{\mathrm{d}x_1}{x_1} - \frac{\mathrm{d}x_2}{x_2} + \left(\frac{\mathrm{d}x_2}{x_2}\right)^2 - \left(\frac{\mathrm{d}x_1}{x_1}\cdot\frac{\mathrm{d}x_2}{x_2}\right)$$

Substituting equations (1) and (2) of the text and noting that $(\mathrm{d}x_1) = \sigma^2(x_1)^2\,\mathrm{d}t$, $(\mathrm{d}x_2) = \delta^2(x_2)^2\,\mathrm{d}t$ and $(\mathrm{d}x_1\,\mathrm{d}x_2) = \rho\sigma\delta(x_1 x_2)\,\mathrm{d}t$ (Okunev and Tippett, 1990) yields equation (4) of the text. Similarly, substituting equations (6) and (7) yields equation (8) of the text.

THE ACCOUNTING REVIEW

A Quarterly Journal of the
American Accounting Association

Editor
A. Rashad Abdel-khalik

Associate Editors

Robert H. Aston
Andrew D. Bailey, Jr.
Bala V. Balachandran
Victor L. Bernard
Ronald W. Hilton
John S. Hughes
Richard A. Lambert
James C. McKeown
James A. Ohlson
Ira Solomon

VOL. 65 APRIL 1990 No. 2

MARK PENNO
Accounting Systems, Participation in Budgeting, and Performance Evaluation
ROBERT P. MAGEE and MEI-CHIUN TSENG
Audit Pricing and Independence
JEFFREY W. SCHATZBERG
A Laboratory Market Investigation of Low Balling in Audit Pricing
JOEL S. DEMSKI and DAVID E. M. SAPPINGTON
Fully Revealing Income Measurement
DIMITRIOS C. GHICAS
Determinants of Actuarial Cost Method Changes for Pension Accounting and Funding
JANET A. MEADE
The Impact of Different Capital Gains Tax Regimes on the Lock-In Effect and New Risky Investment Decisions
IN-MU HAW, VICTOR S. PASTENA, and STEVEN B. LILIEN
Market Manifestation of Nonpublic Information Prior to Mergers: The Effect of Ownership Structure
NOTES
RICHARD M. TUBBS, WILLIAM F. MESSIER, JR., and W. ROBERT KNECHEL
Recency Effects in the Auditor's Belief-Revision Process
WILLIAM KROSS, BYUNG RO, and DOUGLAS SCHROEDER
Earnings Expectations: The Analysts' Information Advantage
DAVID A. ZIEBART
The Association Between Consensus of Beliefs and Trading Activity Surrounding Earnings Announcements

Accounting and Business Research, Vol. 21, No. 81, pp. 87–102, 1990

Financial Reporting: Current Problems and Their Implications for Systematic Reform

David Tweedie and Geoffrey Whittington*

Introduction

Financial reporting has been an area of exceptional innovation in the UK and elsewhere during the past five years or so. Such issues as off-balance sheet financing, accounting for complex capital issues and, more recently, accounting for brand names have become matters of considerable contention and are widely regarded as 'problems' with which the standard setting bodies should deal. The object of this paper is to examine a number of these problems and to identify their common characteristics. We then consider possible systematic principles which the standard setters might adopt in order to cope with these common characteristics and thus eliminate, or at least alleviate, the problems.

Some degree of innovation in financial reporting practices might be regarded as a healthy response to a changing environment. However, from the point of view of the standard setter, some recent innovations can be regarded as problematic because they tend to contradict the principle of standardisation, that like things should be treated in a like manner to enable comparability of accounts, either across different companies or within the same company. They do this either by introducing new types of contract or transaction with which existing standards do not cope (as in the case of complex capital issues) or by enabling the 'repackaging' of transactions which allows them to be treated in a different manner from that prescribed by standards for conventional transactions (as in the case of some creative accounting devices used to justify the application of merger accounting to transactions which would normally be treated by the acquisition method). In considering these innovations as problems we are not implying criticism of them or of particular cases; in many cases they are natural developments (e.g. in the case of finance leases, which were a response to the investment incentives given by the corporation tax system, rather than a deliberate challenge to extant accounting standards) and they have served to highlight the limitations and contradictions of the existing standards. The problems have largely arisen because existing standards have either not kept up with new developments or leave too much freedom of choice. Our purpose in examining these issues is to identify lessons for the future, in particular for standards setters.

Our approach to the selection of systematic principles is to accept the broad consensus on the purpose of financial reports that exists between the Trueblood Report (AICPA, 1973) in the USA and *The Corporate Report* (ASSC, 1975) in the UK, in the 1970s, and, more recently, the conceptual framework projects of the Financial Accounting Standards Board (FASB) in the USA and of the International Accounting Standards Committee (IASC, 1989), the Solomons Report (Solomons, 1989), and the ICAS publication, *Making Corporate Reports Valuable* (McMonnies, 1988), in the UK. Although there are important differences of detail, all of these sources are broadly agreed on the following:

(1) That financial reports are intended to serve *users* and that equity investors and lenders are important components of the user constituency.

(2) That the balance sheet and the income statement (or profit and loss account), supplemented by a flow of funds statement (or possibly a statement of cash flows) are the *fundamental financial statements*.

(3) That users are concerned with *economic* evaluation and decision-making. This implies that measurement should strive to reflect actual economic opportunities and steers us towards current valuation and the estimation of future prospects, rather than historical cost valuation and concentration on past transactions. Insofar as disclosure is concerned, it implies disclosure of all matters which are material to economic decisions and evaluation. The ICAS group (McMonnies, 1988) bravely pins its faith in identifying economic reality, and Solomons adopts the concept of 'representational faithfulness'. We would follow these

---

*David Tweedie became chairman of the Accounting Standards Board (ASB) after writing this article. Geoffrey Whittington is the Price Waterhouse professor of financial accounting, University of Cambridge and is now academic adviser to the ASB. The paper represents the views of the authors and not necessarily those of the ASB.

examples if we were sure that we could define economic reality in a manner which would find general acceptance and could be represented faithfully in practice. Instead, we prefer the more cautious approach of seeking *economic relevance*. The idea of economic relevance is consistent with what is sometimes called an *informational* perspective of financial reporting (e.g. Beaver, 1981, chapter 1). This views accounts as collections of useful information which the user will then interpret to produce a subjective evaluation of the firm. Economic reality, on the other hand, has connotations of identifying 'true' income or value, and the idea of identifying such single-valued summary measures of overall performance or worth seems to us to be inappropriate in a realistic setting of uncertainty and market imperfection or incompleteness.

The rest of this paper proceeds as follows. Firstly, we outline briefly the current issues which we have chosen to describe as problems (defined in the columns of Tables 1 and 2). Secondly, we attempt to derive a taxonomy of the common characteristics of these problems. Thirdly, we discuss the broad principles which we might adopt in order to deal with these common features and thus with the problems themselves. The paper is written with the institutional context and recent experience of the UK primarily in mind, although most of the issues discussed are relevant in some degree to the USA and to other market economies where financial reporting is carried out against the background of active securities markets.

The problems

The recent problems of accounting standard-setting in the UK revolve around what is sometimes called 'creative accounting'. Griffiths (1986) provides a highly readable account of this area of activity, and the high sales of his book are an indication of the importance of and the widespread interest in creative accounting. This book is already, to some extent, out of date, failing to deal with such issues as brand names (which has already become the subject of two ASC technical releases and an exposure draft) and complex capital structures such as that of United Biscuits, which is described in Appendix I to this paper. More up-to-date and technically detailed accounts of current problems will be found in the commentaries contained in *Financial Reporting*, the survey of published accounts which is published annually by the Research Committee of the Institute of Chartered Accountants in England and Wales (Skerratt and Tonkin, 1990).

(1) *Off Balance Sheet Financing*

(i) Leasing. The first of the new creative accounting devices was the finance lease. The growth of lease financing had its origins in tax incentives rather than in any wish to indulge in creative accounting. However, it became apparent that, by entering into certain forms of lease, manufacturing firms could enjoy and exercise virtually all the privileges of ownership of the assets, and incur the equivalent liabilities and costs, whilst formally not owning the relevant assets. Thus, the assets and the corresponding liabilities under the lease would not appear in the balance sheet, in contrast with the case when the asset was brought about and the purchase financed by a loan. Leases of this type therefore offered creative accounting possibilities, as a means of reducing the gearing ratio measured in balance sheet terms (the slice of assets excluded being effectively 100 per cent geared).

The leasing problem was dealt with by ASC in SSAP21, which distinguishes operating leases, of the traditional rental type, from financial leases, which are effectively loan-financed purchases. The essence of the finance lease is that it embodies a series of related conditions which ensure ultimate acquisition of the benefits and risks attaching to the asset. Thus, the economic effect, but not the legal form, is the same as for outright purchase. Although SSAP21 exists, there are marginal cases in defining a finance lease. There are companies such as British Airways whose effective asset base and liabilities are not wholly on balance sheet as a result of the extensive use of leasing (Appendix 2) and the arbitrary nature of the leasing standard's rules.

(ii) Non-subsidiaries

The off-balance sheet financing problem has been made much greater by the use of controlled non-subsidiaries, i.e. companies which are effectively owned and controlled by the holding company but which do not fall within the strict Companies Act definition of a subsidiary. One of the easier methods of achieving this result was to exercise control of the subsidiary, through voting rights, whilst not owning a majority of the equity or controlling the composition of the board of directors. This route has now been closed by the Companies Act 1989, which makes control a condition for a company to be a subsidiary. ED49, issued by the Accounting Standards Committee, attempts to close the remaining gaps by means of a definition of a 'quasi-subsidiary' which must be treated, for group accounting purposes, as a subsidiary. A quasi-subsidiary is defined in terms of effective control by and benefits or risks accruing to the reporting enterprise.

(iii) Contingent contracts

The area of contingent contracts is an important problem currently facing preparers and auditors of accounts. Contingent contracts are a natural outcome of the increasing sophistication of capital markets and of corporate financial management, but they lend themselves to being used purely for cosmetic purposes, to remove weighty liabilities or risky investments from the balance sheet of the holding company. An example of such a contract would be one of sale of stock with an option of future repurchase on terms which were highly likely to be attractive. ED49 proposes that the method of financial reporting should reflect the overall effect of a series of related transactions, rather than a single transaction in isolation. Moreover, it defines assets and liabilities in terms of 'probable future' effect, thus attempting to overcome the contingency problem. This appears to be a potentially powerful method of dealing with these complex transactions although it inevitably also raises certain difficulties inherent in any general solution. In particular, the word 'probable' lacks a clear definition in current accounting practice, and estimating future events always introduces a degree of subjectivity. Thus, the auditor's professional judgement is put under greater stress by this type of remedy.

(2) *Group Accounts*

Group accounting has created problems other than off-balance sheet financing. Notably there are four important aspects: the choice of merger or acquisition accounting, the calculation of fair value and goodwill at the time of the merger, the subsequent treatment of goodwill, and the treatment of associated companies.

(i) Options for accounting for combinations

The choice of two methods of accounting for business combinations, the 'merger' method and the 'acquisition' method, naturally gives rise to the possibility of inconsistent treatment, and therefore creates a potential problem. Merger accounting offers the possible advantages of greater accumulated profits, higher profits for the year of acquisition and higher prospective future profits (because of lower depreciation charges on fixed assets and absence of any amortisation of goodwill), together with a lower valuation of assets, which will raise the apparent rate of return. Acquisition accounting, on the other hand, might offer advantages where a high asset valuation was important (e.g. to reduce the apparent gearing ratio), by offering the opportunity of a mandatory revaluation at 'fair value', although revaluation would also be possible on a voluntary basis under merger accounting. A further possible advantage of acquisition accounting is the opportunity of making provisions for reorganisation expenses, which can be written back in the future to smooth profits. Such provisions are not charged against income in the year of acquisition but reduce the net assets of the acquired company, thereby increasing goodwill: in the UK at present, goodwill is generally written off immediately against reserves. Some companies have seen the relative advantages as favouring merger accounting and have striven to qualify for it by artificial means, such as vendor placings, which make the acquisition look as though the main purchase consideration was shares (the requirement for merger treatment) whilst enabling the vendor to receive cash. However, the real problem for standardisation is not the cosmetic transaction (such as vendor placing) but the existence of two different reporting treatments for identical events, one based on restatement to fair values and one (the merger treatment) on pooling of historical costs.

(ii) Goodwill

The calculation of goodwill and fair value at the time of the acquisition are problems of establishing open market prices when market transactions relating to the particular assets have not taken place. When part of the business acquired requires reorganisation, there may also be the problem of assessing a provision for reorganisation costs. These problems give scope for the cosmetic accountant to under-value the business acquired, thus improving apparent future profitability. Guidance on the principles to be adopted in assessing fair value and goodwill may eventually serve to limit the scope for cosmetic accounting. Merger accounting avoids these problems altogether, but at the price of ignoring the value implications of the acquisition transaction.

The subsequent treatment of goodwill is controversial. One possibility is to write off goodwill immediately against reserves, thus relieving the profit and loss account of any future amortisation charges. Some companies have been so eager to do this that they have created negative reserves in the process. The other extreme is to retain goodwill in the balance sheet permanently, thus again avoiding amortisation charges and also improving the gearing ratio, as measured in the balance sheet. This is outlawed by current company law, which requires the third alternative, that capitalised goodwill be written off by the end of its useful economic life. This has the effect of depressing measured profits, and thus earnings per share, which is a central figure used in the stock market evaluation of shares. The problem of goodwill is created by a choice of treatments of identical situations. There is, more fundamentally, a deep confusion amongst accountants as to whether goodwill is an item which should be regarded as an asset meeting the requirements for inclusion in the balance sheet, an issue which is also raised by the brand names controversy (discussed below).

(iii) Equity Accounting

The final major aspect of group accounting which gives rise to problems is accounting for associated companies, i.e. non-subsidiaries in which the holding company has nevertheless a substantial interest. The profits of associated companies are accounted for on an equity basis, i.e. a share of the profits, rather than merely dividends received, is included in the accounts of the investing group so that there is thus a strong incentive to classify investments as being in associated companies, if it is wished to boost reported profits. This gives rise to a need for clarity and consistency in the rules for defining associated companies. It also raises the important issue that too much weight should not be attached to a single 'bottom line' earnings figure.

(3) *Complex Capital Issues*

The problems of group accounting described above have been made more important in recent years by the high level of take-over activity in capital markets. Those markets have also been innovative and another problem, that of complex capital issues, arises directly from this. Examples of complex capital issues are given in Appendix 3. One typical feature of such issues is the discount on issuing a loan stock. A 'deep discount bond' which has a heavy initial discount can attract a low interest rate because of the ultimate gain accruing when the bond is redeemed at nominal value (Appendix 3, Example 1). This can be a useful type of financial instrument, deferring interest payments and effectively rolling them up in the redemption value, when the company might be better able to pay. However, accounting on the basis of the cash transactions would lead to an understatement of interest expense in the years prior to redemption, if the expense were based only on the interest paid, rather than the prospective premium on redemption, resulting from the discount on issue. Furthermore, at the point of redemption the burden on the profit and loss account might possibly be avoided by treating the redemption premium as a capital item, e.g. being offset against a share premium account. A variation of this technique is the 'stepped interest bond', which has different rates of interest (usually increasing through time) at different periods of its life (Appendix 3, Example 2). A Technical Release of the Institute of Chartered Accountants in England and Wales (TR677) has recommended that the deep discount problem be dealt with by charging the accrual of the redemption premium over the life of the bond and that the stepped interest problem be dealt with by spreading the interest charges at a constant rate over the life of the bond. This solution involves looking at all transactions relating to the bond over its life, including future transactions, rather than judging a year's interest payments in isolation.

Another form of complex security involves various types of option. Convertible loan stocks, which have an option to convert to equity, have been fairly common for some time. They can have taxation advantages as well as offering bondholders an attractive option. However, options to convert or to subscribe for shares can also be used to exercise effective control over companies without formal legal control; they can give debt effectively the properties of equity, and they can create obligations which, although strictly contingent, are highly likely to crystallise in the future. Examples 3 to 8 of Appendix 3 give some indication of the variety of such arrangements. These raise the whole issue as to how far accounting should take a forward-looking, probabilistic view of the effects of transactions or should instead confine itself to a historical record of the formal effect of past transactions. The ASC's current exposure draft, ED49, takes the forward looking view, by preferring overall economic effect to strict legal form. United Biscuits, in the case discussed in Appendix 1, could have argued that the overall economic effect would have been to guarantee a conversion into the ordinary shares of the parent company. ED49 considers *virtual certainties*, e.g. the use of put and call options, where failure to act will cause one party to incur economic damage, so that it is almost certain that a particular course of action will be taken. In the United Biscuits case, however, there was no certainty that the stock market would behave in the way which the parent company anticipated, so that the ultimate decision to convert or redeem depended on factors outside the control of the parent company or its shareholders, and the eventual course of action was much less than certain.

(4) *Brands*

The most recent major controversy concerning financial reporting in the UK has concerned brands. This problem again arose from the activity of capital markets: highly geared companies felt that the absence of brands from their balance sheets led to overstatement of their gearing ratios, and some take-over targets felt that it led to understatement of their assets per share. Thus, the brand problem can be seen to be part of the general problem of goodwill, the excess of the going concern value of a business over the sum of the fair values of the individual separable assets. Where the brand consisted of a copyright, patent or trademark acquired in the open market, it could appear in the balance sheet as a separate asset. However, the brand would often be acquired as part of a group of assets, so that its separate value was difficult to determine. The problem was particularly acute in the case of the internally generated brand, which had not, therefore, been the result of a clearly defined market transaction. In such cases, given the problem of establishing the acquisition cost, it was difficult to argue for the recognition of the brand as a separate asset in the balance sheet, although some firms (such as Ranks, Hovis McDougall) argued that their brands were worth large sums and should therefore be recognised.

It might seem that the forward-looking economic substance approach would favour the reporting of brand values. However, brands raise fundamental questions, which surround the general issue of accounting for goodwill (of which brands are a special case): should the balance sheet record the value of the *assets* of the business or of the business as a whole, and, if the former, is a brand an asset? The former question is clearly answered, in traditional accounting, by concentration on assets, since it makes no pretensions to economic valuation of the going concern, although the economic substance concept, which is implicit in many of the recent ASC pronouncements on creative accounting (e.g. SSAP21 and ED49), moves closer to economic valuation and therefore to the possibility of assessing the value of the business as a whole (the recent research report by ICAS, *Making Corporate Reports Valuable*, suggests a reconciliation of the stock market value of a company's shares with the value of assets per share). The second question raises the whole problem of defining an asset. One test is whether it is separable from the rest of the business, and this is an important feature of ASC's current proposal (ED52) that brands should be recognised only as part of goodwill, rather than separately. Another factor is the 'soft' nature of brand valuations, and this raises the question as to how far the economic substance approach can be carried in accounting practice, where reasonable reliability is required for measurement purposes. This, in turn, raises the question as to whether incorporation in the main accounts should be regarded as a vital issue: there is no law or accounting standard to prevent the directors of a company from including brand valuations in a note to the accounts.

This completes our view of some of the main current problems of financial reporting. This has not aimed to be comprehensive but rather to concentrate on the more important issues which have recently been seen as problems, with the object of identifying some common features. It is these common characteristics to which we now turn. As a prelude to this analysis, Tables 1 and 2 provide a taxonomic summary of the problem areas which we have discussed. These tables provide the raw material upon which the rest of this paper is based.

Common characteristics of current problems

Certain clear themes run through the problems described above and summarised in Tables 1 and 2. They can be classified conveniently under two conventional headings: recognition problems and measurement problems.

Recognition problems are concerned with what is included in the accounts as an asset, liability, revenue or expense. Two distinct types of general recognition problem facing the standard-setter can be identified from our catalogue of specific problems. Firstly, there are problems of defining the scope and nature of the reporting entity, and secondly there are problems of defining assets, liabilities and other components of the accounts (which the Solomons Report describes as 'elements' and 'sub-elements').

The problem of defining the boundaries of the accounting entity emerges most clearly in the case of off-balance sheet financing, particularly the case of non-subsidiary subsidiaries, where the central issue is the determination of which assets and liabilities are to be regarded as attributable to the group of companies. It also arises in the problem of associated companies, where the central issue is whether and under what circumstances a share of the undistributed profits of associated companies should be attributed to the group.

The problems of defining assets and liabilities and associated components of financial statements arise in a wide variety of cases. In leases, for example, the distinction between a finance lease and an operating lease depends upon a decision as to whether the lease contract is, in essence, a rental agreement, creating an expense (an operating lease) or a purchase and financing lease, creating an asset and a liability in addition to an expense (a finance lease). The general problem of goodwill also illustrates the problem of defining assets, and, in particular, whether the balance sheet should record only separable assets or should record the going concern value of the business. Other issues relating to asset definition which arise in connection with goodwill are whether an asset should necessarily be defined by an assignable legal right (such as a patent) and identified by a legal contract, such as purchase. These issues have arisen both in discussion of the problem of goodwill on consolidation and in the recent controversy on brand names.

A theme which pervades all of the above recognition problems is that of uncertainty about future events and how to deal with it. We have seen that contingent contracts have become quite common, particularly in creative accounting techniques, and these magnify the problem of uncertainty by making ownership and valuation dependent upon how certain options are exercised in the future. However, even in the absence of such contracts, economic evaluation is always dependent upon prospective outcomes, so that any attempt to base accounting on economic relevance, or some such concept, is bound to confront the problem of uncertainty. The Solomons Report, which does favour economic substance over legal form,

Table 1
An Analysis of Creative Accounting Methods

			Means					
			Recognition		*Measurement*			
		Desired Effect	*Boundaries of Group Entity*	*Definitions of Assets, Equity, Liabilities, etc.*	*Valuation*	*Capital Maintenance*	*Accounting Problem*	*Possible Solution?*
	Off Balance Sheet Schemes							
1.	Operating and finance leases	Reduction of gearing		✓			Loose definitions	Tighter definitions or emphasis on truth and fairness
2.	Controlled non-subsidiaries	Removal of assets and liabilities from group accounts	✓				Legal definitions out of date/loose definitions in accounting standard	Redefinition of subsidiary (CA89 & ED 49)
3.	Contingent contracts	Removal of assets and liabilities from balance sheet		✓			Lack of definition of assets/liabilities	Redefinition of assets/liabilities
	Business Combinations							
4.	Merger and acquisition accounting	Control of (i) profit for year of combination and following years (ii) gearing ratios			✓	✓	Two treatments dealing with similar event	One treatment
5.	Fair value	Avoidance of increased depreciation or improvement of gearing			✓	✓	Two treatments for similar situations	One treatment; one valuation system
6.	Reorganisation expenses	Increased income			✓	✓	Two treatments for similar situations	One treatment; write-off as extraordinary item?
7.	Goodwill/brand names	(i) Avoidance of annual amortisation (ii) increase or reduction of gearing ratios		✓	✓	✓	Two treatments for similar situations	One treatment, based on a consistent definition of intangible asset

Table 1—*continued*

8.	Equity accounting	Increased profit	✓				Is retained profit attributable to the group?	Recognition only if cash retained in associated company is accessible
	Complex Capital Issues							
9.	Various	(i) Increasing profit (by reducing interest charge) (ii) Reducing gearing		✓	✓	✓	(i) Profit does not reflect full interest charge (ii) Gearing ratio distorted	(i) Accrue full interest charge (ii) Redefine equity; borrowings; minority interest (iii) Develop rule on treatment of uncertainty of conversion
10.	*Irregular valuations*	(i) Higher income because depreciation charges low if revaluation delayed (ii) Gains on disposal greater if revaluation delayed (iii) Gearing radio reduced if revaluation undertaken			✓	✓	No rule for regular revaluation	Requirement for regular revaluation

Table 2
An Analysis of Complex Capital Issues*

		Means					
		Recognition		*Measurement*			
	Desired Effect	*Boundaries of Group Entity*	*Definitions of Assets, Equity, Liabilities, etc.*	*Valuation*	*Capital Maintenance*	*Accounting Problem*	*Possible Solution?*
Deep discount bond (Example 1)	Avoidance of full interest charge against revenue			✓	✓	Income does not reflect real interest	Ensure discount accrued and charged through income statement
Stepped interest bonds (Example 2)	Low interest charges against income in early years of bond			✓	✓	Effective annual cost not shown	Charge interest as it accrues
Convertible bond/preference share with premium on redemption (Example 3)	(i) Avoidance of full opportunity cost of interest (ii) Reduction of gearing (conversion assumed)		✓	✓	✓	(i) Income does not reflect interest charge (ii) Accounts based on estimated Stock Market prices in years ahead	(i) Ensure premium accrued and passed through income statement (ii) Rule required on conversion probability (iii) Definitions required of equity; borrowings; minority interest
Guaranteed (by parent) redeemable preference shares issued by subsidiary (Example 4)	Reduction of gearing (borrowings shown as group shareholders' funds); interest (i.e. guaranteed 'dividends') shown as minority interest in group accounts		✓			Confusion over (i) amount of minority interest (ii) whether payment to holders should be classed as interest or dividend	Definition of equity, borrowings, and minority interest; interest and dividends
Redeemable convertible preference shares issued at a premium by subsidiary (Appendix 1)	Increase in group shareholders' funds, improving gearing ratio Only nominal value shown as minority interest; premium shown as part of group shareholders' funds		✓			Definition of minority interest and group shareholders' funds	(i) Definition of equity and minority interest (ii) Rule required on conversion probability

Table 2—*continued*

Redeemable convertible bonds issued at a premium by subsidiary (Example 5)	Reduction of debt. Only nominal value shown as debt-conversion is assumed	✓	Definition of bonds and minority interest	Definition of borrowing; and minority interest
Convertible preference shares issued by subsidiary with equivalent rights to parent's preference shares (Example 6)	Increase of disclosed shareholders' funds	✓	Definition of shareholders' funds	(i) Definition of equity and minority interest (ii) Rule required on conversion probability
Convertible capital bonds (Example 7)	Reduction of gearing	✓	Bonds have features of share capital	(i) Definition of equity and borrowings (ii) Rule required on conversion probability
Auction preferred shares (Example 8)	Reduction of gearing	✓	Fluctuating coupon rate similar to borrowing	Definitions of equity and borrowings

*Examples of each case are described in Appendix 3 (some cases have elements of more than one example).

recognises this difficulty and lists 'reasonable certainty' of measurement as a criterion for recognising an asset. The more precise definition of reasonable certainty, in a form which is operationally effective, is a challenge facing any standard-setting body which chooses to follow the Solomons approach.

The uncertainty problem affects measurement as well as recognition, and we now turn to the measurement aspects of the problems discussed earlier. There are two central issues relating to measurement: (i) *valuation*, which determines the value of assets and liabilities in the balance sheet, and (ii) the *capital maintenance concept*, which determines the extent to which changes in shareholders' net worth, as measured in the balance sheet, is partitioned between capital and profits,[1] and hence the extent to which gains in value are recognised in the profit and loss account.

However, although measurement can be reduced to these two central issues, each encompasses a wide variety of problems and options for dealing with them. Both issues were at the heart of the debate on accounting for changing prices, which raged for so long in the UK and elsewhere,[2] and current problems of both valuation and income measurement are due in part to the demise of the current cost accounting standard, SSAP16. The pressure of changing prices and the need to report their consequences still exists, but there is at present no systematic way of doing this, and current financial accounting practice in the UK is an uneasy hybrid of traditional historical cost and various methods of current valuation. Equally, the capital maintenance concept used in the recognition of profits is an *ad hoc* system involving reserve accounting but based upon no simple general principle.

The valuation problem pervades all current financial accounting practice in the UK,[3] and is not confined to the specific problem areas described earlier. Amongst these problem areas, as Table 1 shows, the valuation problem is, of course, a pervasive theme. Most obviously, it arises in the choice between merger and acquisition accounting, which involves a choice as to whether we retain original historical cost (merger accounting) or revalue the acquired company and its assets at the time of acquisition (acquisition accounting), with the attendant difficulties of establishing fair values and measuring goodwill. The brand names problem also has an important valuation dimension: the degree of uncertainty surrounding valuation is a strong argument for not recognising this type of asset in the accounts. More generally the valuation of fixed assets, and the consequent depreciation charges, have an important effect on the gearing ratio and on subsequent income, and the discretion allowed in valuing such assets (currently the subject of an ASC exposure draft) gives scope for inconsistency between companies, and therefore for cosmetic accounting. It is also important to remember that valuation applies to liabilities as much as to assets: for example, the problem raised by deep discount bonds is that the nominal value differs from their market value at the time of the issue.

The valuation problem usually works in conjunction with the capital maintenance problem, in its effect on income. Thus, the problem is not merely whether we revalue an asset or liability, but whether the effect of that revaluation will appear in the profit and loss account. Adherents of creative accounting like to accumulate such gains and losses in reserves, from which they can be fed into the profit and loss account at the wish of the preparer of accounts. This may be done in the cause of simple income smoothing, but it could be done with more sinister intentions. Our earlier catalogue of problems contained some good examples of the use of reserves to exercise control over profits, e.g. the write-off of goodwill against reserves, to avoid the burden of future amortisation. One of the more obvious loopholes in contemporary accounting standards which we did not discuss earlier is the concept of 'extraordinary' profits or losses, which are not included in, or changed against, profits on ordinary activities (the measure of profit commonly used in valuing shares), in contrast with 'exceptional' items which are part of this measure of profit.

This completes our analysis of the common characteristics of the problem areas which we identified earlier.

Some possible remedies

One approach to dealing with the problems described earlier is to deal with each one individually on a 'fire fighting' basis. This has, of necessity, been characteristic of much of the earlier efforts of standard-setters. The disadvantage of this approach is that it can lead to inconsistency of approach (hence, perhaps, the wide variety of valuation methods currently in use and the inconsistency between certain standards, e.g. SSAP12 on depreciation and SSAP19 which advocates non-depreciation of investment properties). Furthermore, treating the symptoms rather than the disease can lead to the problems re-emerging in a different form, designed to circumvent the detailed prescriptions intended to deal with earlier forms, e.g. the write-off of goodwill against reserves has been one of the reasons for the emergence of brand accounting.

---

[1] This characterisation of the problem is consistent with the Solomons Report's view of the balance sheet as the fundamental accounting statement and assets and liabilities as the basic elements of financial statements. See Watts and Zimmerman (1986).

[2] We have surveyed this at length in *The Debate on Inflation Accounting* (Tweedie and Whittington, 1984).

[3] A survey of this, by one of the present authors, is Whittington (1989).

A more systematic and general and therefore, hopefully, more effective means of treatment is to design standards to deal with the deeper issues which are common to a number of problems. The identification of such issues was the purpose of the preceding section, and much of this section will be devoted to suggesting the possible lines on which accounting standards could deal with them. However, if we are to use the analogy of a disease, it may be that by 'treating' these general issues we are still treating symptoms (albeit more effectively than on a piecemeal basis) rather than the disease.

The central issue in accounting standard-setting (the 'disease' in our metaphor) is the market failure or failures which make accounting standard-setting necessary. One of these failures is that company managements *individually* have incentives to represent their company's performance in the best possible light (e.g. by creative accounting), although *collectively* they would like accounting practice to conform to high standards in order to inspire confidence in the markets in which they operate (i.e. there is what economists call a free-rider problem). A possible solution (a direct 'cure' for the 'disease') would be for management to be constrained to conform to high standards by the behaviour of users, particularly suppliers of finance,[4] and the auditors who act on their behalf. In practice, these forces are not sufficiently strong to avoid the need for standards. This is partly because auditors find it difficult to deliver a 'true and fair view' without the support of accounting and auditing standards, and partly because users of accounts allow themselves, or are believed by preparers of accounts to allow themselves, to be deceived by cosmetic accounting devices. The latter belief is reinforced by the apparently excessive weight given by financial analysts to 'bottom line' earnings figures and gearing ratios.

This is not the place to discuss in detail the problems of auditors or the limited skills of users,[5] but it is important to be aware that these are fundamental factors which will determine the extent and detail of accounting standards. Detailed prescription is in many ways undesirable: it can lead to inflexibility and to incentives to conduct a standards avoidance game analogous to tax avoidance. However, a vague injunction to auditors to ensure that the accounts 'tell it the way it is' will be inadequate unless auditors have a remarkably similar set of thought processes (so that there is consistency of judgement) and considerable integrity and strength in resisting what is often (wrongly) described as 'client' (i.e. management, not shareholder) pressure. Thus, *some* degree of detail in standards is necessary, and the level of prescription required is a practical matter which is contingent on the strength of the opposing forces. One flexible way in which a standard-setting body can respond to the practical need for prescription is to have fairly broadly defined standards but to issue more detailed interpretations when required. This practice has been followed by the FASB in the USA, although its standards are quite detailed and are not necessarily a model for others to follow.[6]

Whatever form of standard-setting process is adopted, there will be a need for some standards and for those standards to have a broad general direction. The implication of our discussion of current problems and their common characteristics is that the standards should aim to present data relevant to the *economic substance* of a firm's current position and past activities, rather than their simple legal form. Most, if not all, of the current problems are perceived as such because certain reporting methods currently in use do not convey to shareholders and other users of accounts an accurate picture of the economic effect of transactions, whereas users of accounts are increasingly concerned with this aspect of performance. The active capital markets which give rise to innovative transactions and financial instruments also make users of accounts increasingly interested in up-to-date information on the economic position of the company, since the rewards for possessing such information are greater, just as the rewards for a successful creative accounting exercise are greater. Recent exposure drafts and standards of the ASC have, of course, adopted the economic substance approach (notably in ED49 and its predecessor ED42), as have two recent research reports from professional bodies, The Solomons Report (ICAEW, 1989) and *Making Corporate Reports Valuable* (MCRV) (McMonnies, 1988).

It is unlikely that a broad injunction to follow economic substance will be adequate to ensure a level of standardisation which will aid the comparability of accounts. The concept therefore needs to be applied to the central themes which we identified in current problems, i.e. recognition and measurement. The final columns of Tables 1 and 2 are a tentative attempt to propose solutions for the problems identified earlier. These solutions are expressed in rather broad, even vague, terms, but this suits our present purpose, which is to identify the common themes which must be addressed in order to derive general solutions which span different problems in an effective and consistent manner.

---

[4] This is the basis of the Chicago/Rochester view that regulation of accounting should be unnecessary if users and preparers are freely contracting agents in a competitive market.

[5] Lee and Tweedie (1977 and 1981) provide empirical evidence of users' lack of comprehension of some fundamental aspects of accounting methods.

[6] Another possibility is to have an accounting court, similar to that in the Netherlands, which can allow detailed practice to evolve on common law lines, within the broad principles laid down by statute or standard. It should be noted that, under the provisions of the United Kingdom's Companies Act 1989, the courts may require revision of accounts which do not show a true and fair view. This raises the prospect of a new body of case law being developed, relating to the true and fair view.

With regard to recognition, there were two aspects of the problem: the boundaries of the entity and the components of accounts. A definition of the entity is needed (problems 2 and 8 of Table 1) which concentrates on economic substance and hence rules out off-balance sheet financing operations. It will also need to deal with associated companies. One issue which will need to be clarified is the relative importance of ownership and control and the extent to which these factors justify consolidation into group accounts. The informational perspective, which we advocated earlier, must also be borne in mind. Consolidation, to produce a single group 'bottom line', can lead to simplistic results, and disclosure of separate results for associated companies by way of note rather than inclusion in the profit and loss account might be more effective means of dealing with marginal situations.

The definition of assets, liabilities and other components of the accounts in terms of economic substance (needed in relation to problems 1, 3, 7 and 9 of Table 1) has already been proposed by the Solomons Report, and elsewhere (e.g. as part of the FASB's conceptual framework project). It is notable from Table 2 that the definitions of equity, minority interests and debt are subject to particular problems at the present time because of the concern with gearing ratios. The main difficulty which needs to be resolved in this general area is that of uncertainty and, in particular, a more precise definition of the 'reasonable certainty' which Solomons requires as a condition for recognition in the accounts. Again, the informational approach may help: material amounts could be required to be reported by way of note, even when surrounded by a high degree of uncertainty, although 'materiality' may be particularly difficult to define when there is a high degree of uncertainty. Uncertainty affects not only *whether* an item is recognised in the accounts, but also *how* it is recognised. This is particularly the case when convertible securities are involved and there is uncertainty as to whether the conversion right will be exercised, and thus whether it is appropriate to treat the security as a liability or a part of shareholders' interests.

With regard to measurement, we identified two broad issues, valuation and capital maintenance. Of these, valuation poses the greater problems (see items 4, 5, 6 and 7, 9 and 10 of Table 1). The economic substance approach suggests that *some* form of current market value should be the basis of accounting practice, and both MCRV and Solomons agree on this. Current valuation is also increasingly common in accounting practice, albeit on a somewhat unsystematic basis. The problem is that a wide variety of current valuation methods is available: replacement cost, selling price and discounted present value being three broad categories, with alternatives within each category. MCRV adopts a selling price approach and Solomons prefers the eclectic value to the business basis (similar to that used in SSAP16) which selects the value according to economic circumstances. The choice of valuation base is a fundamental issue which requires a high priority in the standard-setting process. It seems highly unlikely that a single current value method will be appropriate for all circumstances, since all can be shown to yield meaningless results in some cases (e.g. selling prices can be irrelevant in the case of 'non-vendible durables'—such as railway tunnels, which cannot be sold for operational reasons—or for which there is no market). If it is agreed that an eclectic method of valuation is appropriate, then a decision must be made as to whether the choice of method should depend on economic circumstances (as in the case of value to the business, or the older 'cost or market value, whichever is the lower' rule), or the nature of the asset (as in the Companies Act requirement to report the market value of listed securities) or the nature of the business (as in the accounting standard on the valuation of investment properties). The informational approach must also be considered: alternative valuations can be reported by way of note (as occurs in current practice). The full information solution of multiple column reporting (as proposed, for example, by Stamp, 1981) also deserves consideration, although it would raise in extreme form one of the problems of the full information approach, cost both to users (in interpreting a mass of information) and preparers (in preparing a variety of expensive information). If it is decided to report only a single current value, valuation according to the nature of the asset has much to commend it, despite its being relatively neglected in the academic literature. It has the advantages of being a natural evolution of current practice in the UK, of consistency across different types of firm, and of potentially being able to accommodate preparation costs and uncertainty of valuation in the most effective manner (since the existence of markets is likely to be specific to type of asset rather than type of firm or economic circumstances of the particular firm). Its obvious disadvantage, from a theoretical standpoint, is that it is unlikely to lead to an aggregate value of the net assets of the firm whose components are all measured on the same basis. This is an important drawback from the point of view of those (such as Chambers, 1970) who attach great importance to a single aggregate 'true' value: it is less important to those who prefer the 'useful pieces of information' approach.

The capital maintenance concept (see problems 4, 5, 6 and 7 of Table 1) may pose fewer difficulties. There are three broad approaches to this: money capital, real capital (i.e. money capital indexed by the general price level change) and physical capital (usually defined in terms of maintaining operating capability, which is not a simple concept). All have potential uses and there is no reason why all three should not appear in the same statement (Kennedy, 1978, provides a demonstration of this). In a manufacturing business, current operating profit (based on maintaining operating capability, broadly as suggested by the Sandilands Report, 1975, and as implemented in SSAP16, 1980, although the rules used there were not necessarily the best) may be a useful figure (showing ability to generate profit at current prices), but we may also be interested in the capital gains or 'holding gains' on the assets of the business. These can be added to operating profit to give total gains in money terms (again on the lines of the Sandilands Statement of Gains). The effect of general inflation can then be deduced to give a total real gains figure. The figures for total gains would articulate with the balance sheet, and, by including all gains, would eliminate the problems of reserve accounting.[7] A similar proposal was made by the Byatt Report (1986) in its proposals for accounting for state-owned enterprise.

Concluding remarks

This paper has attempted to identify the common features underlying the most pressing current problems of financial reporting. The evidence has been in the form of examples rather than systematic survey results. We believe that survey results would support our broad conclusions (e.g. they are consistent with the annual surveys of published accounts published by ICAEW and edited by Skerratt and Tonkin) but we invite other researchers to test them against further evidence and to refine them. We have also attempted, by means of our taxonomy in Tables 1 and 2, to derive systematic 'remedies' which might deal with the problems which we identified. Again, there is scope for considerable refinement, both in relating 'remedies' to 'problems' and also in clarifying the nature of the 'remedies'. For example, in the case of the valuation problem, we have merely sketched out the broad direction of several possible alternative approaches, rather than specifying them in detail or attempting to narrow the choice in a definitive manner. In summary, we have tried to identify some important problems and to sketch out an agenda for research and the development of appropriate standards. We do not claim to offer definitive solutions, but hope at least to have provided evidence of the nature of the problems which exist, within the current context of UK financial reporting. At best, we hope to have defined the broad nature, if not the precise form, of satisfactory solutions. With regard to academic research, we have drawn attention to a number of areas requiring further investigation ranging from the clarification and documentation of 'problems' to the development of precise and feasible 'solutions'. In the latter area, a topic which should be particularly amenable to further academic research is the treatment of uncertainty, which has hitherto received far more attention in the auditing literature than in that of financial reporting.

References

AICPA (1973), *Objectives of Financial Statements*, the Report of a Study Group chaired by R. Trueblood, American Institute of Certified Public Accountants, New York.

ASC (1987), *SSAP12 (Revised), Accounting for Depreciation*, Accounting Standards Committee, London.

ASC (1985), *SSAP15 (Revised), Accounting for Deferred Tax.*

ASC (1980), *SSAP16, Current Cost Accounting.*

ASC (1981), *SSAP19, Accounting for Investment Properties.*

ASC (1984), *SSAP21, Accounting for Leases and Hire Purchase Contracts.*

ASC (1988), *SSAP24, Accounting for Pension Costs.*

ASC (1988), *ED42, Accounting for Special Purpose Transactions.*

ASC (1990), *ED49, Reflecting the Substance of Transactions in Assets and Liabilities.*

ASC (1990), *ED52, Accounting for Intangible Fixed Assets.*

ASSC (1975), *The Corporate Report, a discussion paper*, Accounting Standards Steering Committee, London.

Beaver, W. H. (1981), *Financial Reporting: An Accounting Revolution*, Prentice-Hall.

Byatt Report (1986), *Accounting for Economic Costs and Changing Prices, A Report to HM Treasury by an Advisory Group*, (2 volumes), HMSO.

Chambers, R. J. (1970), 'Second Thoughts on Continuously Contemporary Accounting', *Abacus*, September, pp. 39–55.

Griffiths, I. (1986), *Creative Accounting: How to Make Your Profits What You Want Them to Be*, Sidgwick and Jackson.

IASC (1989), *Framework for the Preparation and Presentation of Financial Statements*, The International Accounting Standards Committee.

ICAEW (1977), *TR677, Accounting for Complex Capital Issues*, The Institute of Chartered Accountants in England and Wales.

Kennedy, C. (1978), 'Inflation Accounting: Retrospect and Prospect', *Cambridge Economy Policy Review*, No. 4, pp. 58–64.

Lee, T. A. and D. P. Tweedie (1977), *The Private Shareholder and the Corporate Report*, The Institute of Chartered Accountants in England and Wales.

Lee, T. A. and D. P. Tweedie (1981), *The Institutional Investor and Financial Information*, The Institute of Chartered Accountants in England and Wales.

McMonnies, P. (ed.) (1988), *Making Corporate Reports Valuable*, ICAS and Kogan Page.

Sandilands Report (1975), *Inflation Accounting: Report of the Inflation Accounting Committee* (chairman F. E. P. Sandilands), Cmnd. 6225, HMSO.

Skerratt, L. C. L. and D. J. Tonkin (eds.), *Financial Reporting 1989/90, A Survey of UK Published Accounts*, Chartac Books.

---

[7] This system is elaborated in Tweedie and Whittington (1984).

Solomons, D. (1989), *Guidelines for Financial Reporting Standards*, ICAEW.

Stamp, E. (1981), 'Multi-Column Reporting', in T. A. Lee (ed.), *Developments in Financial Reporting*, Philip Allan, pp. 57–77.

Tweedie, D. P. and G. Whittington (1984), *The Debate on Inflation Accounting*, Cambridge University Press.

Watts, R. L. and J. L. Zimmerman (1986), *Positive Accounting Theory*, Prentice-Hall.

Whittington, G. (1974), 'Asset Valuation, Income Measurement and Accounting Income', *Accounting and Business Research*, Spring, pp. 96–101.

Whittington, G. (1989), 'The Valuation Problem in Contemporary Financial Reporting in the United Kingdom', in G. Macdonald and B. A. Rutherford (eds.), *Accounts, Accounting and Accountability*, Van Nostrand Reinhold and ICAEW, pp. 151–178.

Appendix 1

The United Biscuits case

In 1988 United Biscuits issued, in an overseas subsidiary, redeemable preference shares convertible at the holders' option into equity of the parent company, United Biscuits, itself, with redemption options annually from 5 to 10 years after issue. The issue was worth £110m consisting of 22,000 £1 shares issued at £5,000 each. The shares were ultimately convertible into United Biscuits' equity shares with a nominal value of £9m. As there was then no definition of what constituted a 'minority interest'* this item was not shown, as might have been expected, at £110m. Instead, it was assumed that before 10 years had elapsed the share price of United Biscuits would have increased sufficiently to make it worthwhile for the preference shareholders to convert their shares and consequently minority shareholders were shown at £9m, being the nominal value of the equity shares to be issued by United Biscuits on conversion. The remaining £101m was reflected on group reserves where goodwill (arising on the acquisition the £110m was raised to finance) was written-off against it. If events did not turn out as expected then:

- minority interest would have been understated;
- the anticipated conversion would not have taken place;
- and, consequently, the effect of redemption would not have been reflected—at 5 years the redemption cost to the company would have amounted to £131.4m and at 10 years to £164.3m compared to the issue price of £110m (see also Appendix 3, example 3).

Appendix 2

The British Airways case—an operating or a finance lease

It is presumed that a finance lease exists if, at the inception of a lease, the present value of all minimum lease payments, including any initial payment, amounts to substantially all (normally 90% or more) of the fair value of the leased asset. The lease term is the period for which the lessee is contracted to lease the asset and any further terms which the lessee has the option to continue to lease the asset, with or without further payment, which option it is reasonably certain at the inception of the lease that the lessee will exercise (SSAP 21, paragraphs 15 and 19).

In the 1987 prospectus for British Airways 25 aircraft were shown to be on extendible operating leases, namely nine 757s and sixteen 737s. The cost to the lessor was some US$600m. The aircraft were obtained on short leases which enabled British Airways to return the aircraft up to the end of the sixth year with certain residual liabilities, not expected to be material. Up to the end of the sixth year British Airways could elect to convert the operating lease into a finance lease for the remaining portion of a 15 year term from delivery. It was clearly assumed that it was not reasonably certain that the lease would be extended and therefore the operating lease treatment was used in the accounts.

Appendix 3

Examples of complex capital issues

1. *Deep Discount Bond*

Example: a bond with a nominal value of £100 is issued at £40. The coupon rate is often nil or very low. The interest on the bond is in practice the £60 difference between the amount received and the amount paid over to the lender at the end of the loan term. Section 130 of the Companies Act 1985 enables discounts allowed on the issue of debentures of the company to be set off against the share premium account. According to the law, therefore, the interest charge of £60 which is only paid on redemption could be charged to the share premium account, thereby bypassing the profit and loss account. This has yet to be done in practice although Greycoat Group PLC generated publicity in 1987 by announcing its intention to charge the deep discount directly to the share premium account:

Note 11—Capital commitments and financing (part):

> On 24 April 1987 the Company issued a £50,000,000 Zero Coupon Bond 1995 at 43.6496 per cent and the proceeds of £21,500,000 net of expenses were received on that date. The bond has been issued as part of the financing arrangements for the Group's property development programme. The discount due to redemption of the bond, being the difference between the nominal amount and the proceeds received, will be covered by part of the anticipated growth in the value of the related properties. As the discount on the bond will be met from the underlying capital growth, it will be written off in the accounts over the term of the bond directly against the share premium account. The amounts charged each year will be equivalent to the annual rate of interest implicit in the issue price of the bond. On completion, interest on the bank facilities financing these developments will absorb most of the anticipated rental income from the relevant properties.

Source: Greycoat Group PLC: Accounts for the year ended 31st March, 1987

No charges have yet been made against share premium account as in 1988 Greycoat amended its policy so that during the development of the property the accrued discount is capitalised. Following completion it will be charged to share premium account.

2. *Stepped Interest Bonds*

A bond is issued with interest of, say, 6% rising to, say, 26% in increments of 2% per annum. The objective of this particular financial instrument is to match low cash flows against low interest charges at the beginning of a project. TR677 issued by the Institute of Chartered Accountants in England and Wales suggested that the effective rate computed over the anticipated life of the bond should be charged to each annual profit and loss account irrespective of the amount paid in the year.

Some companies appear to charge the interest payable during the year, although the policy is not stated explicitly, e.g. Hambros Investment Trust PLC, 1988:

Stepped interest debenture stock

> Interest was payable on the stock at the rate of 11 per cent per annum for the year to 31st March 1988. The rate of interest will increase by 2 per cent per annum commencing on 1st April 1988 and thereafter by 2 per cent per annum until 1st April 1990 whereupon it will be fixed at the rate of 17 per cent per annum until final redemption.

---

*The Companies Act 1989, Schedule 2 defines minority interest as 'the amount of capital and reserves attributable to shares in subsidiary undertakings included in the consolidation held by or on behalf of persons other than the parent company and its subsidiary undertakings'.

> If for any reason the stock becomes repayable under the terms of the trust deed prior to its redemption date the holders will be entitled to repayment of the nominal amount of their stock together with a sum of additional interest calculated in accordance with a formula set out in the trust deed.
>
> The company or any of the subsidiaries will be entitled to purchase stock in the market or by tender (available to all holders of the stock) at any price, or to puchase stock by private treaty at any price (inclusive of accrued interest but exclusive of expenses) not exceeding 110 per cent of the middle market quotation of the stock (based on The Stock Exchange Daily Official List) on the last business day preceding the date of purchase, but not otherwise.
>
> If not previously repaid or purchased by the company or its subsidiaries the stock will be redeemed at par plus accrued interest on 31st March 2018.

Source: Hambros Investment Trust PLC: Accounts for the year ended 31st March, 1988

3. *Convertible Bonds/Preference Shares with Premiums on Redemption*

A bond or preference share is issued at £1. Conversion terms are one bond/preference share for one ordinary share. The share price at the date of issue is 80p but the bond/preference share can be redeemed at the holders' option in five years time at 125p. In practice some companies have assumed their share price would be greater than 125p at the time of redemption and therefore conversion would take place. No accrual is made for the extra 25p potential liability which could be deemed either to be additional interest/dividend or, if converted, part of the opportunity cost of not selling the share on the market as a normal issue. For example: The Burton Group PLC 1987

> During the year the Company issued, for general corporate purposes, £110 million 4¾% Convertible Bonds 2001 at 100% of nominal value. Bondholders have an option to redeem the Bonds on 25th August 1992 at a price representing 136½ of the principal amount of the Bonds or to convert into Ordinary Shares of The Burton Group PLC at a price of 315p per share. No provision has been made for the additional cost, if any, in the event that Bondholders exercise their option to redeem the Bonds in 1992. The Bonds may be redeemed at the option of the Company at a premium to the issue price reducing annually until 25th August 1993 and thereafter at par, provided that the market price of Ordinary Shares is at least 410p per share.

Source: The Burton Group PLC: Accounts for the financial year ended 29th August, 1987

See also Appendix 1.

4. *Redeemable Preference Shares Issued by a Subsidiary (Guaranteed by Parent)*

Preference shares issued by a subsidiary which can be redeemed by the holder are guaranteed in respect of dividends and repayments by the parent company. The guarantees vary but could ensure that 'dividends' are paid irrespective of whether or not the parent company has distributable profits. Similarly, on liquidation of both the subsidiary and the parent it is possible, depending on the terms of the issue, that the holders of the preference shares would rank equally with the creditors of the parent company. Given that dividends for shareholders of the parent company can only be paid out of distributable profits and that holders of any form of shares in the parent would rank behind creditors the problem arises in the group accounts of whether the subsidiary's preference shares should be classed as debt. Example: BHH Group PLC.

Post balance sheet event note.

In March 1989 a new subsidiary, BHH Trading Limited, acquired a portfolio of properties from Slough Trading Estate Limited for a consideration of £43.75 million (including costs). The acquisition was financed by the issue of preference shares in another subsidiary company which are redeemable in March 1996 at the total price of £45 million together with an amount equivalent to interest at LIBOR (subject to a maximum of 13.5% and a minimum of 10.5%) plus 1% per annum, less any dividends paid.

Guarantees [presumably by the parent company] have been given in respect of current dividends and redemption principal, and investors ultimately have recourse to the assets of BHH Trading Limited.

The following pro-forma balance sheet shows the effect of the acquisition as if it had taken place on 31 December 1988:

	31 December 1988 *Pro-forma* *£000*	*Actual* *£000*
Fixed assets	42,063	42,063
Current assets		
Stocks	72,510	28,760
Debtors	7,294	7,294
Cash at bank and in hand	11,778	278
	91,582	36,332
Creditors	(46,156)	(35,906)
Net assets	87,489	42,489
Called up share capital	17,664	17,664
Reserves	24,825	24,825
Shareholders' funds	42,489	42,489
Called up preference share capital	45,000	
	87,489	42,489

Source: BHH Group PLC: Accounts for the year ended 31 December 1988

5. *Redeemable Convertible Bonds Issued at a Premium by Subsidiary*

Bonds with a low nominal value are issued at a premium by a subsidiary. On redemption only the nominal value is repaid. However, the bonds can be converted into preference shares of the subsidiary company at the full amount of the money received and will be redeemed at that amount if not converted into equity shares of the parent.

In the accounts of J. Sainsbury plc for the 52 weeks ended 17th March 1990 the entire amount of such an issue has been deemed to be minority interest.

6. *Convertible Preference Shares Issued by a Subsidiary with Equivalent Rights to a Parent's Preference Shares*

Example: Costain Group PLC issued preference shares in a subsidiary with similar rights to those that preference shares of the parent company would have. In the balance sheet shares were shown outside shareholders' funds as 'preference share capital issued by a subsidiary' adjacent to, but not within, 'minority interest'. In the profit and loss account the preference dividends were shown after minority interests and extraordinary items.

Share Capital and Reserves	Notes	1988 £m	1987 £m
Called up ordinary share capital	21	44.3	41.7
Share premium account	22	64.6	37.5
Revaluation reserve	22	85.8	47.3
Profit and loss account	22	205.0	196.9
Related companies and long term joint ventures	22	16.4	16.1
Ordinary Shareholders' Funds		416.1	339.5
Preference Share Capital			
Called up preference share capital issued by subsidiary	23	46.7	—
		462.8	339.5
Minority interests		3.9	18.5
		466.7	358.0

Note 23 to the accounts

Preference Share Capital

On 24 August 1988, a subsidiary company, Costain Finance N.V. incorporated in the Netherlands Antilles with limited liability, issued 9,600 $7\frac{1}{2}\%$ Guaranteed Redeemable Convertible Preference Shares 2003 at an issue price of £5,000 per share to raise £46.7 million, net of expenses. The issue was used partly to refinance the acquisition of Dow-Mac Concrete Limited (now Costain Dow-Mac Limited) and partly for general corporate purposes. The shares are guaranteed on a subordinated basis by Costain Group PLC, and convertible into, at any time up to 17 August 2003, ordinary shares of Costain Group PLC at £3.50 per ordinary share. The shares can be redeemed at their issue price on 24 August 1993 and upon the revocation, in certain circumstances, of the subordinated guarantee at prices between the issue price and 106 per cent thereof. Any shares outstanding on 24 August 2003 will be redeemed at their issue price.

Source: Costain Group PLC: Accounts for the year ended 31st December, 1988

7. *Convertible Capital Bonds*

These bonds are convertible into equity shares, usually via an exchangeable, redeemable preference share option (see example 5). The essential feature is that there is a mechanism to prevent the issuing group being obliged to repay the bond holder as a bond holder except in the event of default. The bonds will be guaranteed by the parent.

For example, such bonds were issued in October 1989 by British Airways PLC and presented between shareholders' funds and minority interest in the accounts as follows:

	1990 *£m*	*1989* *£m*
Capital and Reserves		
Called up share capital	180	180
Reserves		
Revaluation	121	167
Other	(18)	(9)
Profit and loss account	629	411
	912	749
Convertible Capital Bonds 2005 (Note 19)	320	—
Minority Interests	—	1
	1,232	750

Extract from Note 19

In October 1989 British Airways PLC raised £320 million through the issue of $9\frac{3}{4}$ per cent Convertible Bonds 2005 by a subsidiary, British Airways Capital Limited. The Bonds were offered by way of rights to existing ordinary shareholders of the Company on the basis of four Bonds of £1 each for every nine British Airways PLC shares then held. The terms of the Bonds allow the holders to convert into British Airways PLC ordinary shares during the period 1993 to 2005 on the basis of one ordinary share for each £2.43 of Bonds held. The terms also provide that on maturity in 2005 the Company may require remaining bondholders to convert their Bonds into ordinary shares of the Company which would be sold on their behalf. If the proceeds of such sale are less than the issue price of the Bonds the Company has to fund any deficit from its own resources.

In these circumstances the Directors consider that it is highly probable that the proceeds of the issue of the Convertible Capital Bonds will become part of the Company's called up share capital in due course and therefore will be available to the Group on a permanent basis. Accordingly the Convertible Capital Bonds have been included in the Group balance sheet under Capital and Reserves.

Source: British Airways PLC: Accounts for the year ended 31 March 1990

8. *Auction Preferred Shares*

Auction preferred shares have been issued in the United States and are therefore denominated in US$, thereby possibly acting as an effective hedge for net investment in US businesses similar to the use of currency borrowings as a hedge under SSAP20 principles. Usually a panel is formed to invest in these shares. The panel periodically bids for them by stating the coupon they require to be paid on the shares. The effect is that a market rate of interest is always paid on these preferred shares. The shares are not repayable except at the option of the issuer and therefore they do not possess a major feature of debt, i.e. repayment at the behest of the holder. Repayment only takes place either at the option of the issuer or on winding up after all creditors have been paid. Example: Thorn EMI

Extract from Minority Interest note

	1989 £m	1988 £m
Preference shares in subsidiaries:		
$5\frac{3}{4}$ per cent Guaranteed Redeemable Convertible Preference Shares 2004	103.0	—
Auction Preferred Stock	118.3	105.8
Other	7.8	19.8
	229.1	125.6

Thorn EMI America Finance Inc., a wholly-owned subsidiary registered in Delaware, USA, has in issue 200 shares of Auction Preferred Stock of US$1m each. The dividend rate varies (predominantly with prevailing interest rates) and is set every 7 weeks at an 'auction' at which the shares are also traded. Funds raised from this issue have been loaned to other Group subsidiaries. Repayment of the loans is guaranteed by the Company.

Source: Thorn EMI PLC: Accounts for the year ended 31st March, 1989

Book Reviews

Accounting for Management Decisions. *John Arnold and Tony Hope.* Prentice-Hall 2nd ed., 1990. xvi + 412 pp. £16.95.

According to the authors, the principal changes in this edition include additional material on the organisational context of accounting, pricing and marketing strategies and an introduction to the capital asset pricing model. As the title implies, the organisation of the book derives from a rational decision driven view of the management accounting process. The reader is led through an introduction and discussion of accounting and decision making (Chs. 1 & 2), into chapters on time value of money, risk and uncertainty and relevant costs in part 1 of the book. Part 2 on applications covers CVP analysis, cost estimation, pricing, decision making with scarce resources and long term decision making, with budgeting, variance analysis and divisional performance sitting a little uncomfortably at the end.

The book's strengths, as with the first edition, lie in its clear exposition of those aspects of decision making derived from the economics literature; the part 1 coverage and the discussion of relevant costs is particularly good in this respect. The treatment of other economic aspects of decision making is also concise, lucid and helpful, and the inclusion of a section on the learning curve is a useful addition. However, the authors claim that theirs is a book about management accounting and presumably, by implication, all of it. It is thus irritating to find that a book published in 1990 adopts a rather purist 1970s neo-classicist style, being largely based upon what Scapens has termed a 'conventional wisdom' type approach. Cost allocation and absorption costing are barely mentioned; overhead absorption is introduced by way of an illustration on product pricing, and then dismissed inside a couple of pages. This is particularly unhelpful, given the large body of literature on this area and the prevalence of cost allocation and absorption in practice (together with the requirement to cover this topic which is effectively imposed on universities and polytechnics by the professional accounting bodies). Many may feel that they would gladly sacrifice the somewhat Allenesque chapter on divisional performance ('Everything you ever wanted to know about divisional performance, but were afraid to ask', in 20 pages), for one which explores the cost allocation area in more detail. The book could also have been strengthened by a more integrative approach to some of the behavioural and organisational aspects of decision making and control; this might also have allowed the chapters on budgeting and variance analysis to be more tightly woven into the rest of the text than they appear to be at the moment. Coverage of the latter areas could also have been improved. As an example, a useful and detailed discussion of risk and uncertainty in Chapter 4 is not brought into a discussion of the budgeting process; the chapter on variance analysis and standard costing adopts a fairly conventional approach to the topic, with no real attempt to discuss issues relating to the introduction of new technology.

One central difficulty with the book is that it cannot quite make up its mind on whether it is a first or second year text; for the most part it offers a sound, although economically biased, introduction to management accounting for first year undergraduates, yet the material on divisional performance, weighted average cost of capital and the capital asset pricing model seem unnecessary complications at this level, and arguably involve areas which are better left to a more rigorous analysis elsewhere. At the same time, the remaining content does not have sufficient depth to elevate the book to the level required of a second year course. Its suitability for professional courses is also limited by the exclusion of cost allocation issues.

However, in spite of the above criticisms, this is a well written textbook that avoids the turgid style of many of its competitors. Topics are logically ordered and clearly explained, and the additional examples that this edition has at the end of each chapter will enhance its usefulness in tutorials. The new edition is an improvement on its predecessor, and would be this reviewer's preferred choice for a first year text, yet it is frustrating that the authors have not chosen to include the breadth of material necessary to make this a truly comprehensive introductory text on management accounting suitable for undergraduates. The authors may of course claim that this is not their intent; but such a stance would seem a little at odds with both the description on the back cover, and the requirements of many management accounting courses.

University of Exeter Alan Gregory

Risk, Regulation and Investor Protection. *Julian Franks and Colin Mayer.* Oxford University Press, 1989. pp. xvi + 225. £25.

This book is a report of a study commissioned by the Investment Management Regulatory Organisation (IMRO) to assess the appropriateness of the capital requirements imposed on investment management businesses under the Financial Services Act as a basis for protecting their customers (in particular 'ordinary investors') against the risks resulting from mismanagement, failure or malpractice.

UK accounting and financial academics have little enough time these days to write books, let alone read the books written by others. I presume that accounting and finance practitioners are an even worse case. It is therefore highly desirable that a book should conform to the ideal of the traditional country church sermon: 'tell them what you are going to say, say it, then tell them what you have said'. This book fulfils this criterion admirably. For those with little time the introduction is crisp and clear. For those with more time the analysis, evidence and arguments are developed in a logical manner. Moreover, each chapter itself meets the criterion, having both an introduction and a summary. And for those whose memories are short the concluding chapter succinctly recaps the arguments.

A priori a 'capital adequacy' requirement seems unlikely to be relevant to losses that might arise where the intermediary does not hold any investment funds on its own account. The study reinforces that a priori argument with, inter alia, surveys of investment managers, reviews of 'failures' and 'frauds' in the last decade, and a comparison between the UK and US regulatory mechanisms. It makes a well argued case, including the cost-benefit considerations, that the regulators should look to other approaches for protecting investors who make use of investment managers (including the strict separation of clients' monies and stronger audit and insurance requirements). The present requirements may impose unnecessary barriers to entry to the industry which are inefficient and anti-competitive.

As the influence of securities market regulators (national and international) increasingly determines accounting practices both in the financial securities industry itself and for companies seeking finance from the capital markets (see e.g. IASC, Statement of Intent: Comparability of Financial Statements, July 1990, para. 19), this study is also of interest to accounting theorists in thinking about the potential—or lack of potential—of financial statements for providing suitable measures of 'capital adequacy' for regulatory purposes. If you have the time you should read it yourself and you should certainly recommend it to students on courses relating to regulation and/or the financial services industry.

Aberystwyth University College Richard Macve

Afro-Asian Journal of Accounting

Call for Papers

Scholars resident in, originally from, or who have recent experience of, countries in Africa, Arabia or Asia are invited to submit articles, notes or book reviews to the AFRO-ASIAN JOURNAL OF ACCOUNTING whose first issue will be in late 1991.

The principal objective of the new journal is to air issues of particular concern to the Afro-Asian region in the fields of accounting, auditing, taxation and financial control. Articles may be empirical, model building, surveys of comparative practice, reports of teaching experiences or appositely theoretical. Notes should be reports of empirical work, including pilot studies or teaching points. Books reviewed must be explicitly targeted at audiences within the Afro-Asian region. Articles should be between 2,000 and 5,000 words all inclusive; notes and book reviews less than 1,500 words. References should be in Accounting Review style.

The journal will follow a double blind refereeing process. The submitted piece will be appraised by the editor for relevance to the principal journal objective. It will be passed to a regional or country editorial board member for appraisal of its value in highlighting regional concerns. It will also be reviewed by an expert in the discipline area concerned. The whole process is guaranteed to generate a reply to the author in no more than six months.

Send pieces to the Managing Editor: Gabriel D. Donleavy, Hong Kong University Business School, Hong Kong University, Hong Kong. Fax: 852 858 5614; Email: GDON@HKUCC.BITNET.